



## INSTRUCTION MANUAL

ARG 180 • ARG 200 Plus • ARG 220 Plus • ARG 230 Standard • ARG 230  
ARG 230 Plus • ARG 240 • ARG 240 Plus • ARG 290 Plus



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**Dear customer,**

thank you for buying our product and we wish you a lot of success with it. For proper machine function please pay an attention to this instruction manual.

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## 0. In general

This instruction manual provides the users assistance and information about the PILOUS bandsaw and the possibilities of use corresponding to its purpose. The instruction manual contains important instructions for a safe, adequate and economically efficient operation. Observing the operating instructions will prevent hazards, reduce the repair and outage time costs, and increase the machine reliability of a system. The instruction manual must always be available at the machine site. The instruction manual must be read and used by the staff entrusted with the machine installation, transport and storage, use/operation, maintenance and disposal. In addition to the instruction manual and the binding rules related to accident prevention valid in the user's country and at the service site. It is also necessary to observe the approved rules for safe and professional work.

### Warranty letter - service

Warranty letter is a separate part of the instruction manual.

**Warranty period length:** see warranty letter.

#### Terms of validity of the warranty letter :

- Machine transport, manipulation and storage according to the instruction manual.
- Machine usage, operation and maintenance according to the instruction manual.
- Machine connection to the electrical grid supply according to the instruction manual.

#### The warranty letter does NOT include :

- The machine user's or third person violent and mechanical machine damage.
- Remediless event (elementary disaster).
- Machine damage during transport.
- Machine storage or placing in wet, chemical or otherwise dangerous environment.

**Address any possible comments on the warranty letter by fax, or mail to the address shown on the warranty letter.**

#### Notice for the user:

The seller is obliged to issue warranty letter to the user when the product is dispatched. The warranty letter must be signed and confirmed by the seller's stamp with the date of issue and product serial number. The seller is obliged to introduce the product to the user.

#### Data needed to apply for the warranty (after warranty) machine repair:

- Machine type
- Warranty letter number (same as machine serial number)
- Warranty letter issue date

## 0.1. Safety provisions

The machine design complies with the technical status and the approved safety and technical rules. In spite of this the user's or the third persons' health can be endangered and/or the machine or other tangible goods may be unfavorably influenced during the operation of the machine. In order to prevent such hazards it is unconditionally necessary to observe the safety instructions in this instruction manual. These safety instructions must be read and understood by the respective persons before the machine has been put into operation. Failure to observe these instructions may cause serious property damage and damage to health! The safety instructions are marked in this instruction manual with safety symbols / danger spot signs.



**Dangerous place caution -  
be very careful!**



**Caution of dangerous electrical voltage!**



**Use eyes and ears protection!**



**Use protective gloves!**



**Necessary to use high boots or hard duty  
shoes with protective steel forepart and  
anti-sliding sole!**



**Read the instruction manual carefully and make  
sure you understood its content before using the  
machine!**

## 0.2. Scope of use / use by determination

The machine is designed exclusively for normalized metallic materials. Any other use is considered as not adequate to the purpose. The manufacturer is not responsible for damage due to such a risk. The use complying with the purpose includes also observing the operating instructions, checking and maintenance conditions.

**Examples of cutting materials:** structural steel • case-hardening steel • free-cutting steel • heat treatment steel • antifriction bearing steel • spring steel • tool steel • high-speed steel • copper • brass • cast steel • cast iron • aluminum • plastic materials

## 0.3. Requirements concerning operators

**The machine may only be operated by persons instructed in safety at work and technically trained!**

The machine may only be operated if in perfect condition with respect to technical safety. The user is obliged to check the machine for visually ascertainable damages and failures at least once per shift. Any changes, failures and damages of protective covers, changes of the machine behavior endangering the safety should be immediately reported to the superior. Wait for the decision about the repair and the repeated putting into operation. No protective covers may be removed, moved, put out of operation or changed during the machine operation. Otherwise the guarantee claims have no effect. If any protective has to be removed during operation or maintenance, secure the main switch in the „OFF“ position by a padlock or disconnect the bandsaw from the mains.



**Only electricians or persons instructed in electrotechnical work and supervised by electrical specialists are allowed to open the electric equipment housings and to work on the electric equipment!**

- while working with the machine remove all free clothing and cover long hair
- make sure that all other persons are at least 5 m far away from the saw blade and protect them from chips and possibility of saw blade breaking
- make sure that all persons helping you with know all safety rules
- safety rules must be showed clearly in the working area
- keep your hands far enough from the saw blade and never adjust the saw blade when the engine is on. Switch off the engine and secure it against running before any manipulation with the saw blade

## 0.4. Requirements concerning machines - safety equipments

### CAUTION - DANGER OF INJURY!



**The saw band is not covered in the machining zone!  
Wait until the saw band is in standstill before opening the protective covers.  
Danger in working zone of the swing arm!  
Do not use the machine when tired, overwork, under medicines, drugs or alcohol!**

The horizontal bandsaw is a machine tool. For machining the saw band must penetrate into the workpiece in the metal-cutting zone. The covers protecting against contact with the saw band may therefore be installed only outside the metal-cutting zone.

## 0.5. Protective Covers

Outside the metal-cutting zone the saw band and the saw band discs are protected against contact. The protective covers may be only removed when the main switch is off and secured against switching on or when the machine is disconnected from the mains. The emergency shut down of the machine is effected by depressing the **TOTAL STOP** push-button. Putting the machine into operation again is only possible after pulling and unlocking the push-button manually.

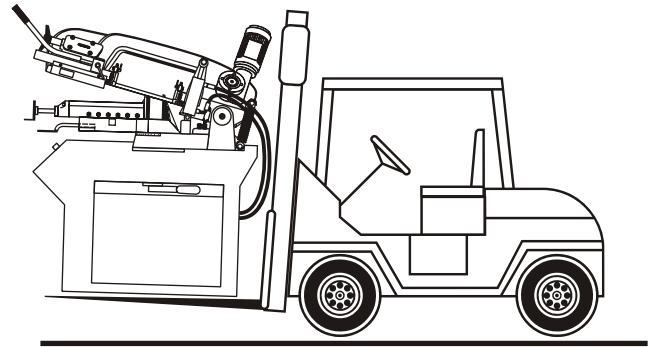
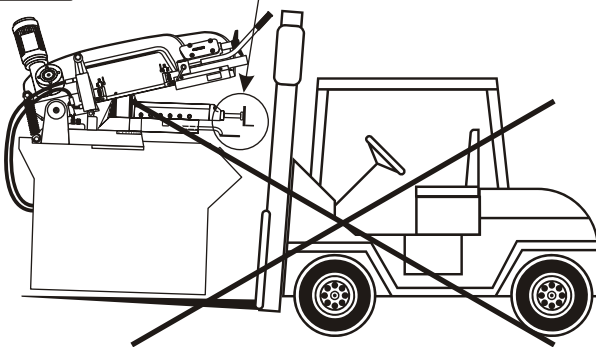


**Manual machine cleaning and waste remove while the machine is running is forbidden. The working place must have first aid set. When working with the machine proper work clothes, boots and protective instruments(eyes and ears protections, gloves, proper work boots) must be used. Abide clean air and work space rules.**

## 1. Transport and storage



### **DANGER OF DAMAGE!**



**The machine may be transported and lifted only by a fork lift. USING A CRANE IS NOT PERMITTED!**

#### **Standard accessories:**

- 1 bimetallic saw band M 42 (mounted)
- 1 coolant unit with a metal chips tank
- 1 length stop 500 mm

### 1.1. Surface Treatment

The machine is provided with a primer and a two-component polyethane varnish. The sliding surfaces are provided with antirust oil. The other machine parts are zinc coated or blackened.

### 1.2. Packing

The basic element of the package is a wooden frame which according to the kind of dispatch may be crating or an overseas case. Approximately 100 mm clearance should be provided for transport and loading by a fork lift truck. For the transport the machine is packed in a stretching foil protecting against weather influences.

### 1.3. Installation

Remove the wooden frame. Position the machine at site. Align the machine by a water level and four M12 setting screws in the base corners. Remove antirust protection and dust from the sliding surfaces and apply oil again. Attach the length stop. Make sure that energy supply is connected (see chapter 4.3). Opening the base door, make sure that the coolant discharge pipe has not come off the coolant tank cover and is correctly attached in the tank. Fill the machine tray with the coolant (approx. 15 litre), the fluid will continuously pour into the tank in the base.



Endangering with dangerous matters cannot be excluded when handling coolants. Observe in your own interest the manufacturer's and/or your company's instructions and recommendations/operating instructions related to safe handling with coolants.

### 1.4. Dismantling

Empty and clean the metal chips tank and the coolant tank. Clean the machine. Provide the sliding surfaces with antirust oil. Make sure that the machine has been disconnected from electrical energy supply. Prepare the swing arm protection for transport. Lift the machine and screw on the wooden frame. Provide a clearance of approx. 100 mm for transport by a fork lift truck. Check whether all protective covers of the machine are screwed on. Enclose the machine accessories.



**CAUTION : Used coolants are special waste!**  
**Disconnecting the machine from the electrical energy supply may be only carried out by electricians!**

### 1.5. Disposal

When the machine has been definitely put out of operation, it should be disposed of in accordance with the provisions valid in the respective country. We recommend to contact a company specialized in waste disposal.

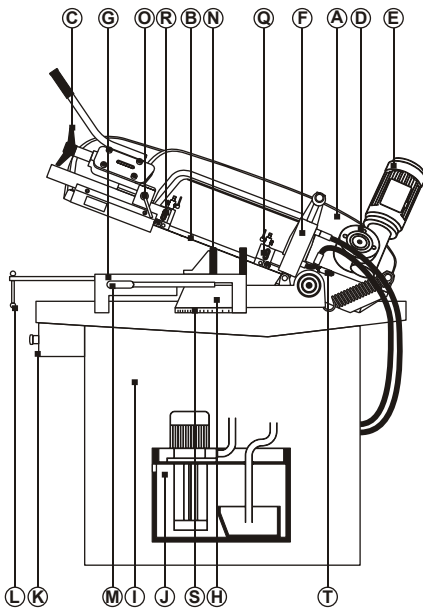


## 2. Machine Data

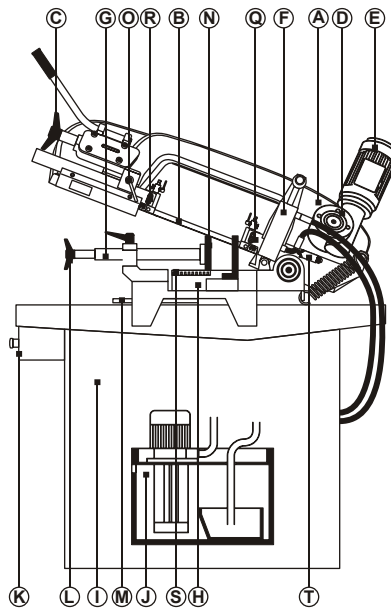
This horizontal bandsaw is used for cutting different kinds of material. The swing arm raising, the work feeding, clamping and removal are carried out manually. An endless welded metallic band serves as the cutting tool. The band is tensioned mechanically by a tensioning running wheel. The running wheel is driven by a driving wheel driven via worm gearbox by a two-stage motor. In the cutting zone it is precisely guided in the band guide heads.

<b>A</b> swing arm	<b>H</b> revolving worktable	<b>O</b> moving bar lock lever
<b>B</b> band	<b>I</b> base	<b>P</b> quick clamping lever
<b>C</b> band tensioning wheel	<b>J</b> coolant and pump tray	<b>Q</b> fixed bar with band guidance
<b>D</b> gear box	<b>K</b> control panel	<b>R</b> moving bar with band guidance
<b>E</b> engine	<b>L</b> vice hand wheel	<b>S</b> angle scale
<b>F</b> oil damper	<b>M</b> worktable lever	<b>T</b> limit switch
<b>G</b> vice	<b>N</b> moving jaw	

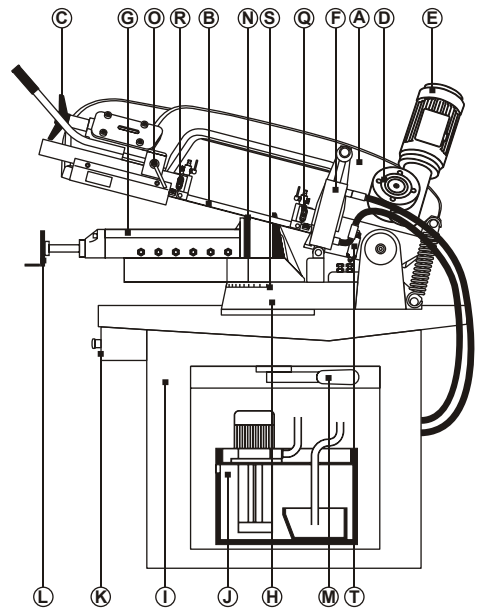
**ARG 180**



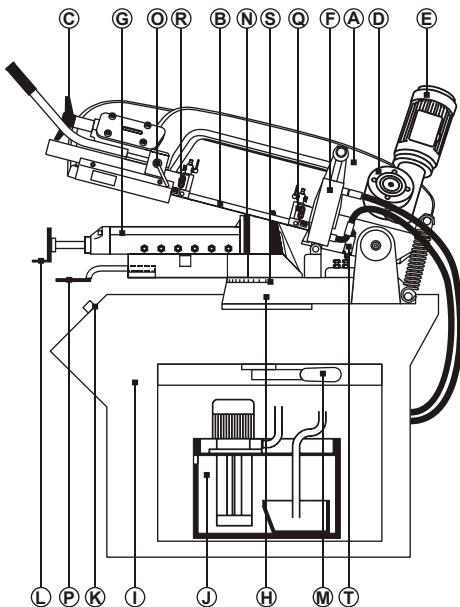
**ARG 200 Plus, 220 Plus**



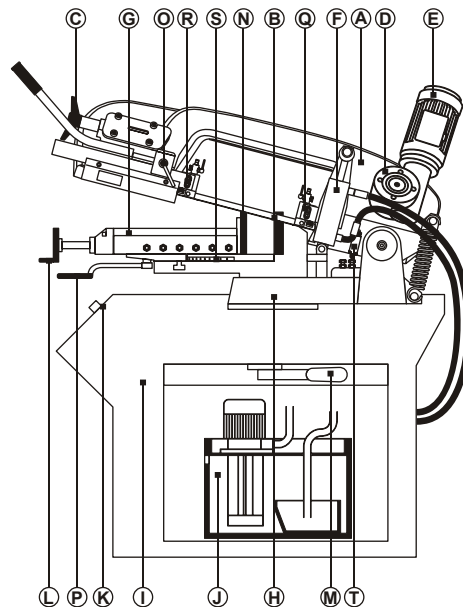
**ARG 230 Standard**














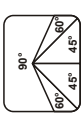
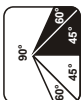













**ARG 230, 240**











































**ARG 230 Plus, 240 Plus, 290 Plus**



### 3. Technical data

		ARG 180	ARG 200 Plus		ARG 220 Plus		ARG 230 STANDARD	ARG 230
MAIN ENGINE		400 V, 50 Hz 0,3 / 0,45 kW	400 V, 50 Hz 0,75 / 0,95 kW		400 V, 50 Hz 0,9 / 1,4 kW		400 V, 50 Hz 0,75 / 0,95 kW	400 V, 50 Hz 0,75 / 0,95 kW
PUMP ENGINE		400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW		400 V, 50 Hz 0,09 kW		400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW
BAND SPEED		50 / 95 m/min	40 / 80 m/min		40 / 80 m/min		40 / 80 m/min	40 / 80 m/min
CUTTING RANGE	[mm]	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°
	∅	180 150 100	200 130 90	220 160 100	220 160 100	220 160 100	220 125	220 125
	a	180 150 100	200 110 90	220 150 100	220 150 100	220 150 100	195 120	195 120
	a x b	240x140 150x130 100x160	245x150 140x90 160x115 90x120	265x150 160x130 200x140 115x100	265x150 160x130 200x140 115x100	265x150 160x130 200x140 115x100	220x105 125x80	220x105 125x80
ARM SWING		 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°	 90° 45° 60°
SAW BAND SIZE		2220x13x0,9	2490x20x0,9		2600x27x0,9		2465x27x0,9	2465x27x0,9
SAW BAND GUIDING WHEELS DIAMETER		245 mm	300 mm		300 mm		300 mm	300 mm
VICE WORK HEIGHT		900 mm	895 mm		895 mm		910 mm	910 mm
OIL INSIDE THE DAMPER		PARAMOL HM 46	PARAMOL HM 46		PARAMOL HM 46		PARAMOL HM 46	PARAMOL HM 46
COOLANT TANK		approx. 15 lite	approx. 15 litre		approx. 15 litre		approx. 15 litre	approx. 15 litre
MACHINE DIMENSIONS		1300x660x1500	1350x660x1450		1400x660x1400		1300x620x1400	1300x900x1400
MACHINE WEIGHT		195 kg	220 kg		250 kg		280 kg	350 kg



		ARG 230 Plus	ARG 240	ARG 240 Plus	ARG 290 Plus
MAIN ENGINE		400 V, 50 Hz 0,75 / 0,95 kW	400 V, 50 Hz 0,9 / 1,4 kW	400 V, 50 Hz 0,9 / 1,4 kW	400 V, 50 Hz 0,9 / 1,7 kW
PUMP ENGINE		400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW
BAND SPEED		40 / 80 m/min	40 / 80 m/min	40 / 80 m/min	40 / 80 m/min
CUTTING RANGE	[mm]	 90°  45°  45°  60°	 90°  45°  45°  60°	 90°  45°  45°  60°	 90°  45°  45°  60°
	∅	215	240	240	290
	a	100	200	170	220
	a	110	180	140	190
ARM SWING	a	190	220	240	290
	b	110x60	190x150	160x100	230x125
	a×b	125x100	115x115	190x130	250x290
		75x80		120x120	155x155
SAW BAND		 90°  60°  45°	 90°  60°  45°	 90°  60°  45°	 90°  60°  45°
SAW BAND SIZE		2465x27x0,9	2710x27x0,9	2710x27x0,9	3110x27x0,9
SAW BAND GUIDING WHEELS DIAMETER		300 mm	300 mm	300 mm	355 mm
VICE WORK HEIGHT		910 mm	910 mm	910 mm	915 mm
OIL INSIDE THE DAMPER		PARAMOL HM 46	PARAMOL HM 46	PARAMOL HM 46	PARAMOL HM 46
COOLANT TANK		approx. 15 litres	approx. 15 litres	approx. 15 litres	approx 15 litres
MACHINE DIMENSIONS		1300×900×1400	1400x900x1330	1400×900×1330	1600×950×1600
MACHINE WEIGHT		430 kg	390 kg	470 kg	540 kg

## 4. Installation

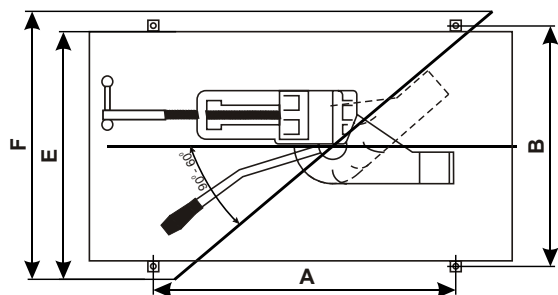
### 4.1. Space Requirements

The machine may be installed on any suitable even hall floor (concrete surface). Observe the permissible floor load.

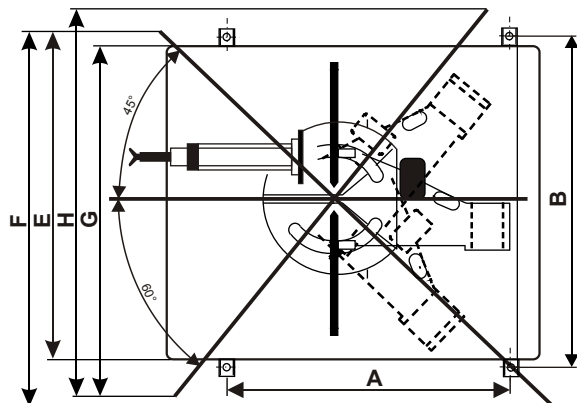
#### Recommendations / assumptions:

- Allow for sufficient work feed space, work removal and the machine maintenance - the operators' working area should be 1 m around the machine and 0,5 m around the roller conveyor.
- Install roller conveyors and/or a case for cut pieces for a safe handling of work pieces and to prevent endangering by falling cut pieces, if any.
- Install a lifting mechanism for heavy work pieces.
- Provide for good lighting of the workplace.

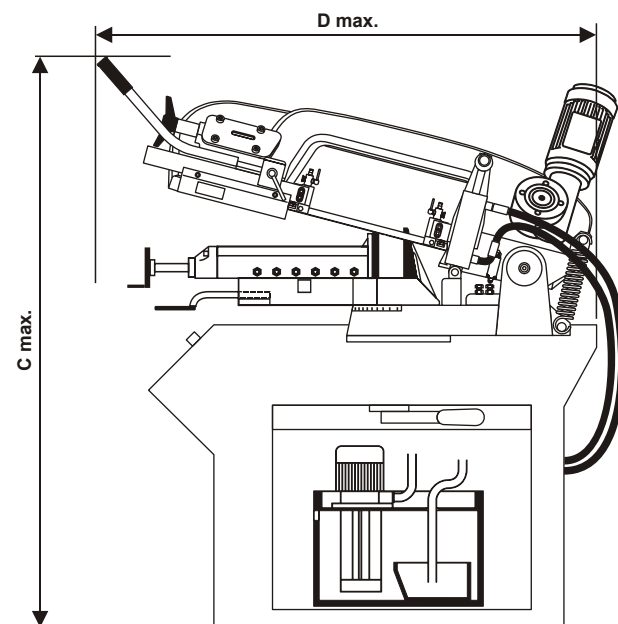
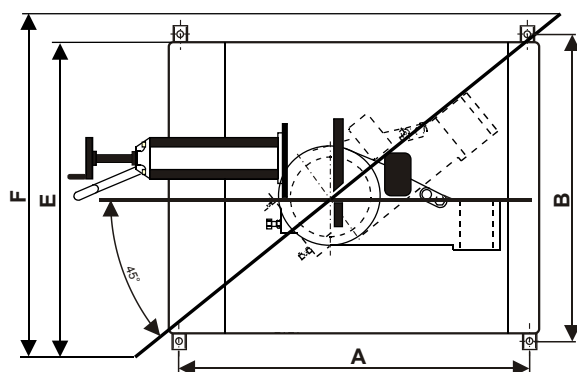
#### ARG 180



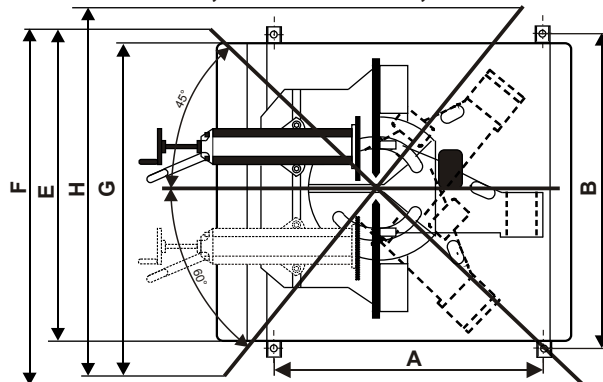
#### ARG 200 PLUS, ARG 220 PLUS



#### ARG 230 Standard, ARG 230, ARG 240



#### ARG 230 Plus, ARG 240 Plus, ARG 290 Plus



	ARG 180	ARG 200 Plus	ARG 220 Plus	ARG 230 Standard	ARG 230	ARG 230 Plus	ARG 240	ARG 240 Plus	ARG 290 Plus
A	720	720	720	730	845	850	845	850	905
B	625	625	625	635	940	950	940	950	1005
C	1800	1820	1830	1910	1880	1895	1940	1945	2040
D	1240	1230	1230	1580	1633	1621	1795	1745	1690
E	1050	1100	950	1028	1115	1030	1125	1098	1210
F	1160	1250	1650	1238	1190	1030	1200	1098	1270
G	x	920	1070	x	x	894	x	1258	1335
H	x	980	1230	x	x	1330	x	1368	1430

## 4.2. Machine installation



**Protect the machine against humidity, rain and dust!**

The machine may be operated in the ambient temperature between +5° and +40°C. The average temperature must not exceed +35°C over the period of 24 hours. In temperatures below +5°C the conventional coolant should be replaced by a fluid working with respective temperatures.

## 4.3. Connection to energy supplies



**This work may only be carried out by electricians!**

Make sure that the voltage of the electrical grid, voltage protection and connection voltage is according to requirements in chapter 3. Technical data. When connecting machines into the electrical grid 3NPe, 50 Hz, 400 V, TN-S notice carefully the **colored cables marking** : L1 Black, L2 brown, L3 black, N blue, P/E yellow/green. **In case of wrong connection of neutral or protective cable the machine electric parts may be damaged and injury by electrical current may occur!** The lead-in cable of the machine should be connected to a protected 16 A socket, in case of a direct connection to the mains the cable should be provided with a lockable main switch. In case of wrong direction of turning of the motor switch together cables L1 black and L2 brown.



**Failure to observe this causes the bandsaw drive motor and the coolant pump running in wrong directions. Possibility of machine destruction!**

## 5. Machine description

### 5.1. Band guide

Before and after the cut the saw band is guided in two guide heads provided with eccentrically arranged bearings enabling an easy setting of the band in comparison with the guiding on moving wheels and guided in the hard-metal guides on both sides and on the upper band edge. The right-hand guide head is fixed. The left-hand guide head mounted on the guide bar is moving and is fed as close as possible to the work. It is provided with a protective cover as far as the machining zone.

### 5.2. Band exchange, tensioning and adjustment

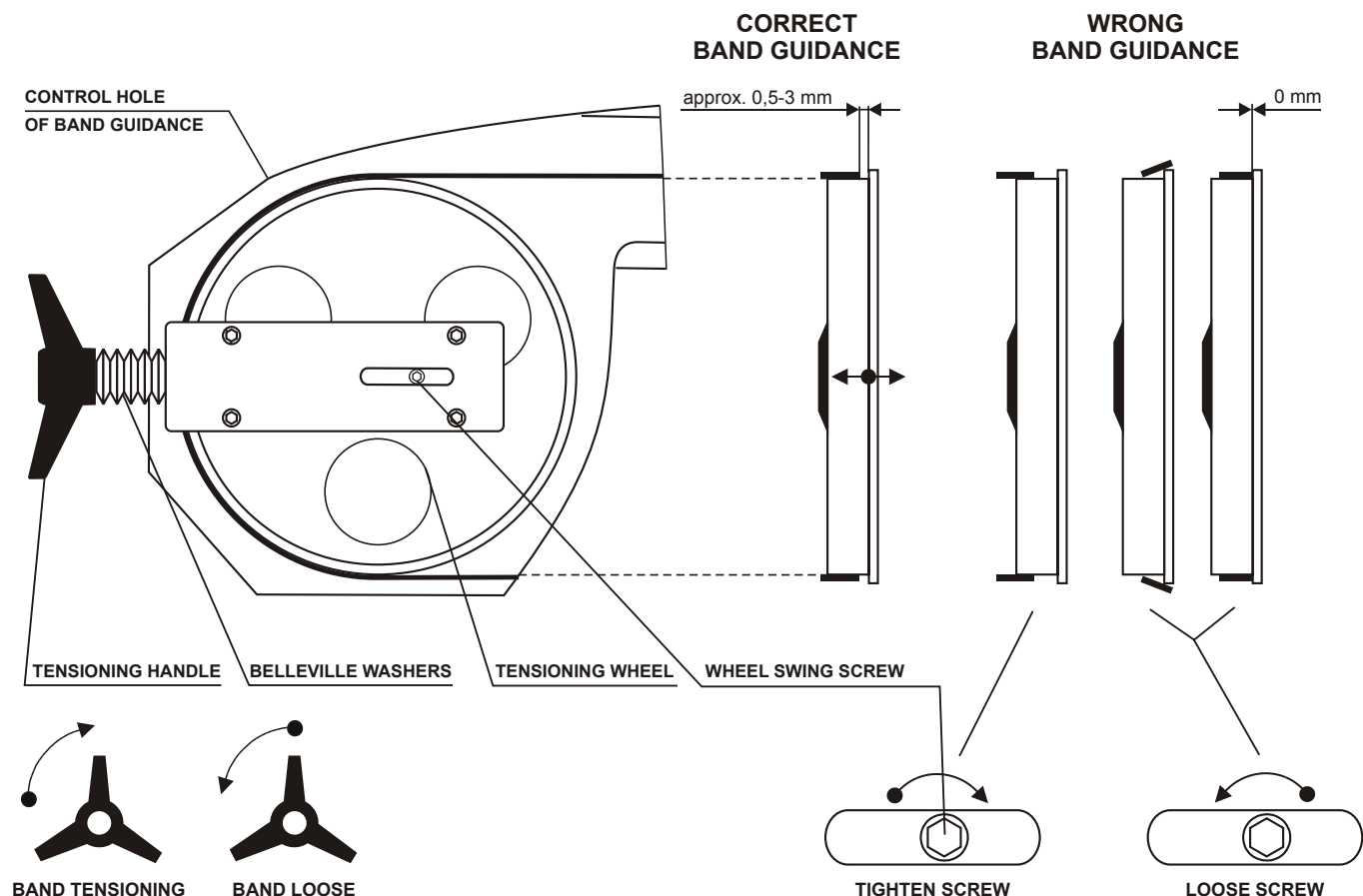
To achieve perfect cutting function, surface quality and workpiece correct measures, in time band exchange is needed. Blunt blade may cause higher energy consumption, inclined cuts and cut surface roughness. One of the most important factors for band life time and the cut quality is the band correct and enough tensioning.



**Caution! It can only be done when the main switch is off and secured against switching on again or when the machine is disconnected from the mains.**

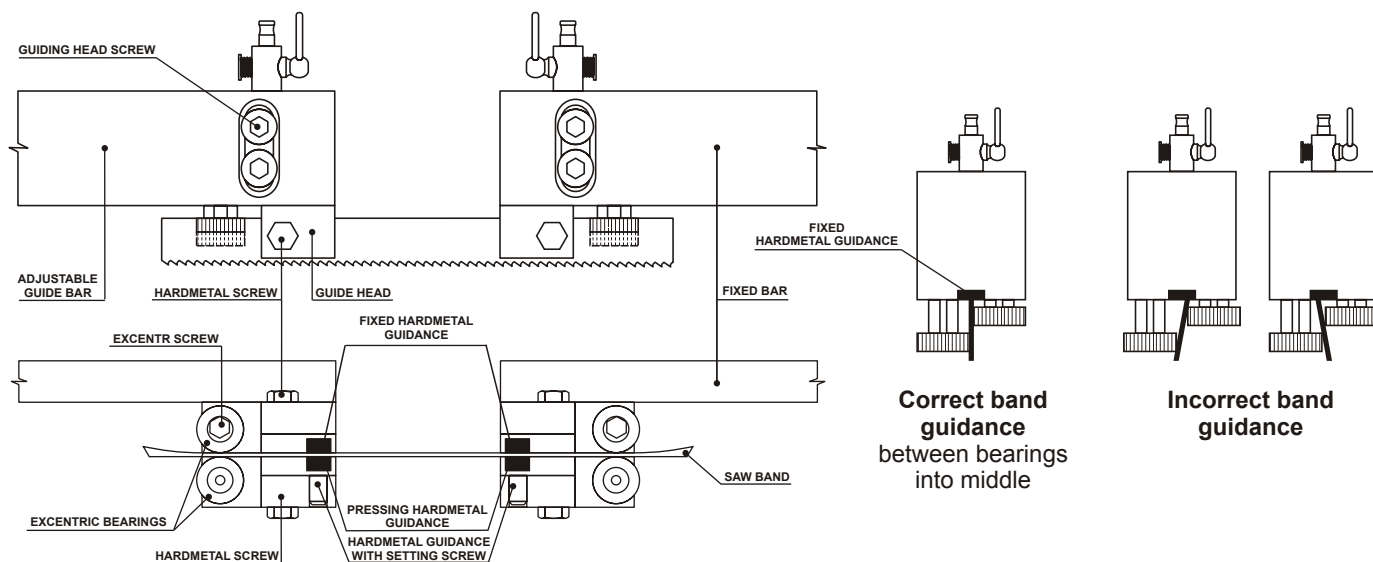
**Caution! Danger of injury by the sharp band teeth. Use protective gloves. Do not touch the guide wheels and the band.**

Turn OFF the main switch and secure the machine against switching ON again during band exchange. Close the oil damper valve (see chapter 5.6.). Raise the arm to position 20 mm above vice fixed jaw. Take off the arm rear cover. Loosen the tensioning handle and the tensioning wheel and thus the whole band. Take off the band from the running wheels and out of the guide heads (see chapter 5.3.). Insert the new band in the guide heads. Put the band on the running wheels and tighten the tensioning handle so that the belleville washers will be pressed completely (no light going through them). Close the band cover, turn ON main switch and witch the speed to the minimum. Press start the button to run the band so it turns one round. Turn OFF a main switch and secure the machine against running again. Open the band cover and check if the band is correctly guided on the running wheels (see a picture below). If the band is not correctly set on the running wheels loosen the tensioning handle and with a wheel swing screw correct (see picture below). Tighten the tensioning handle again. Close the band cover. Exam the band run again. Turn OFF main switch, open band cover and check the setting of band on the running wheels. According to need repeat this cycle till the band is set on the running wheels properly. Then close the band cover turn ON main switch and make first cut.



### 5.3. Guide heads - adjustment

The correct adjustment of the bearings and hard-metal guides principally influences the band life and the quality of the cut. The eccentrically arranged bearings of the guide heads must be so set that the band surface is parallel to the surface of the hard-metal plates and that there is minimum clearance between these plates and the band.



### Guide heads - adjustment

Set the adjustable guide head to be far from the fixed guide head approx. 20 cm. Remove the coolant hoses from the guide heads. Unscrew the guide heads from the fixed and adjustable bars and turn them by 180° (bearings and hard metals guidance up) and screw them to the bars. Make sure that the heads are upright mounted to the bars in the same height. Check the fixity of hard metal tightening. Take old band (approx. 30 cm of it) and put it in the guide heads between hard metals and bearings. Set the pressing hard metal guidance by width adjusting screws so the band moves inside the hard metals without any clearance but without rub. Set the bearings to the band in away so the band moves through them moves them all but do not shear and is not loosen. The bearings must be drifted by the band. Make sure all screws are tightened properly. Take away the guide heads from the bars and put the band on the running wheels properly. Put on the guide heads on the band and fix them on the bars. Close the band cover and switch main switch on. Try to run the band on the running wheels. If the band is slipping adjust the band properly.

## 5.4. Vice - Workpiece Clamping

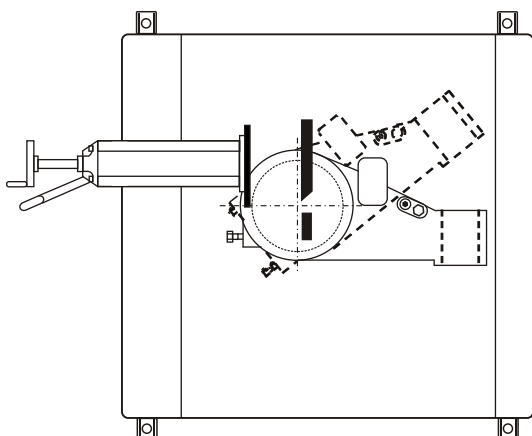
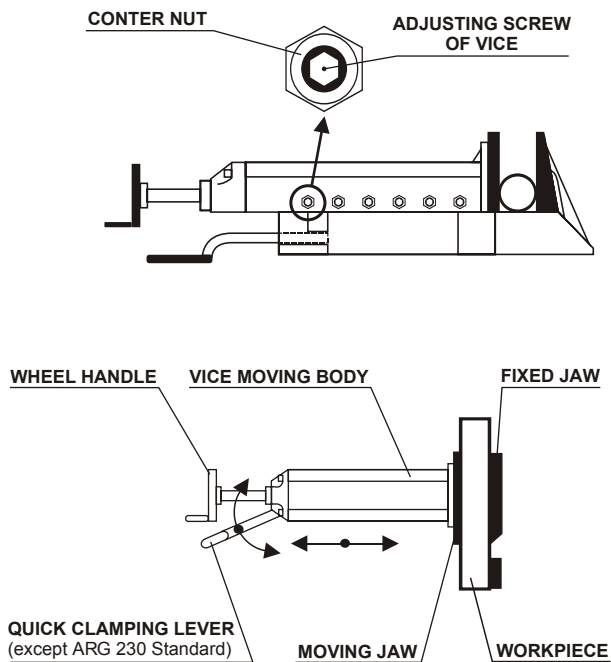
The machine design allows for cutting the material under various angles without its handling. The material is permanently clamped between the fixed gripping jaw and the moving gripping jaw. The adjustment of the required cutting angle is made by turning the whole arm including the revolving worktable after releasing the worktable eccentric lever. When the required angle has been set (acc. to the angle scale), secure the revolving worktable by tightening the worktable quick-clamping lever. The stop bolts serve for a stable setting of the limit angles. The quick-clamping lever (ONLY ARG 230, 230PLUS, 240, 240PLUS and 290PLUS) enables a comfortable and sufficient workpiece clamping. When materials of equal dimensions are being cut, it enables the releasing of the material necessary for the feed and re-clamping only by the lever without using the handwheel.

### 5.4.1. Vice side clearance setting

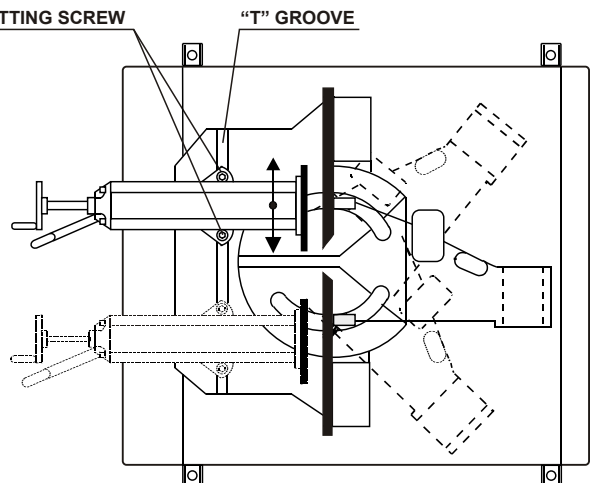
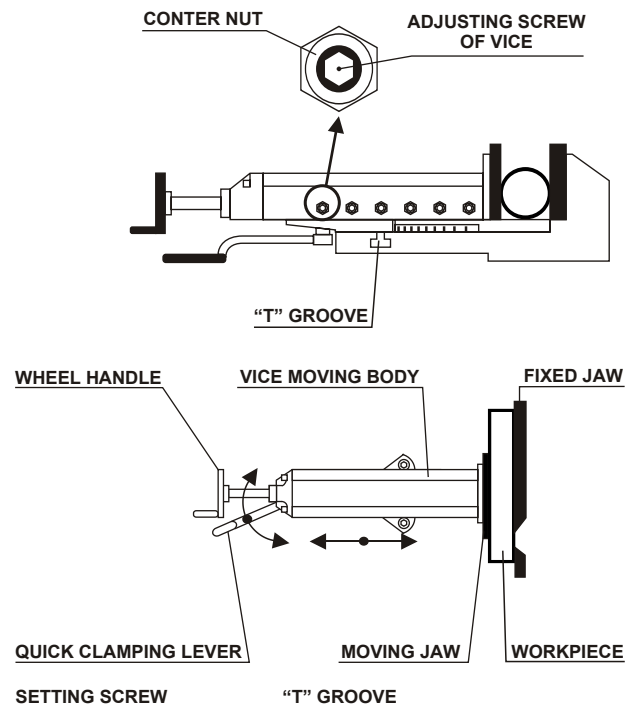
Models ARG 230 Standard, ARG 230, ARG 230 Plus, ARG 240, ARG 240 Plus and ARG 290 Plus only. On other models the vice is set from the manufacturer for the complete machine lifetime.

- ① open the vice to the maximum possible length
- ② loosen lock nut M8 and screws
- ③ start tightening the first screw (starting from the vice jaw) till you feel that you reached the vice ribbon
- ④ secure the lock nut in this position
- ⑤ drift the vice moving part to the same position in which previous screw was adjusted
- ⑥ repeat steps ③, ④, ⑤
- ⑦ continue like above till the vice is set

#### ARG 230 Standard (without quick clamping), ARG 230, ARG 240

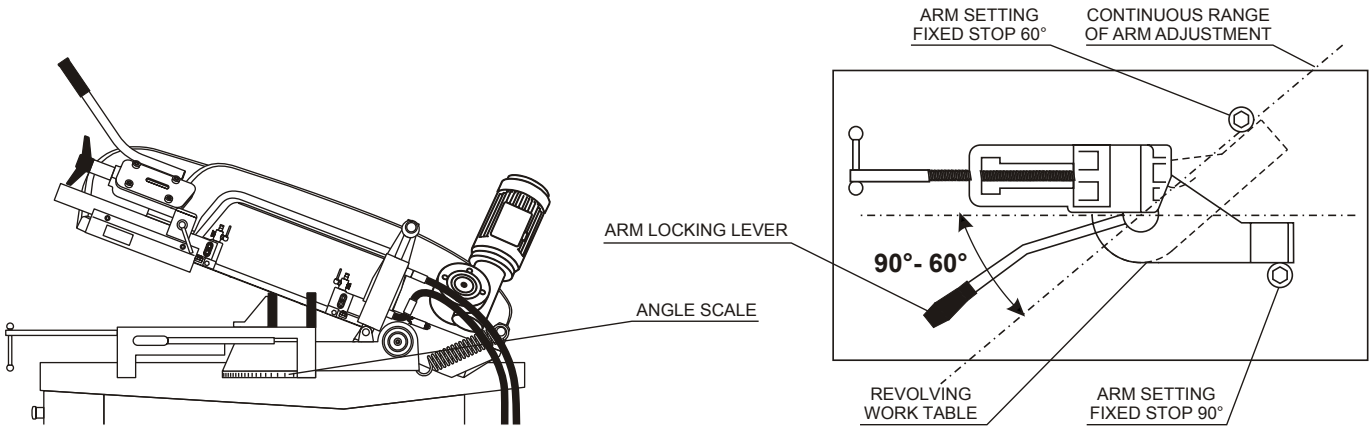


#### ARG 240 Plus, ARG 290 Plus

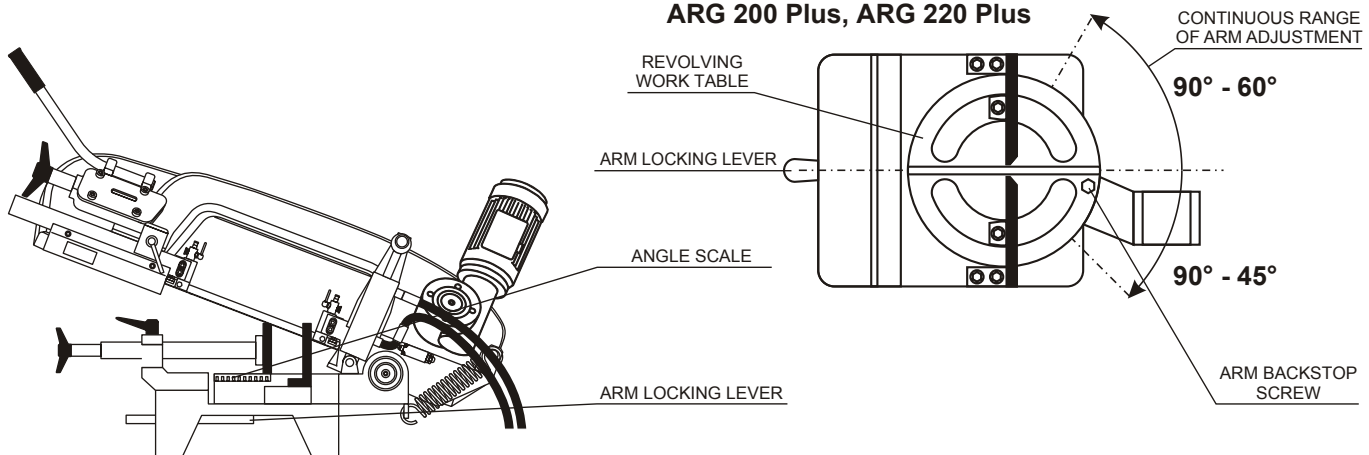


5.4.2. Setting of Cutting Angles

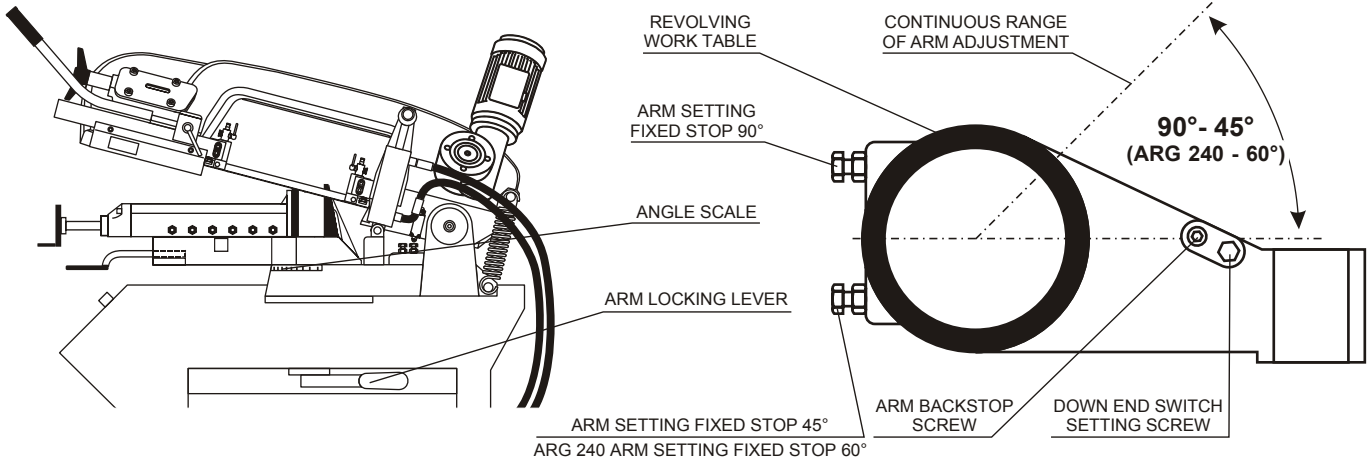
ARG 180



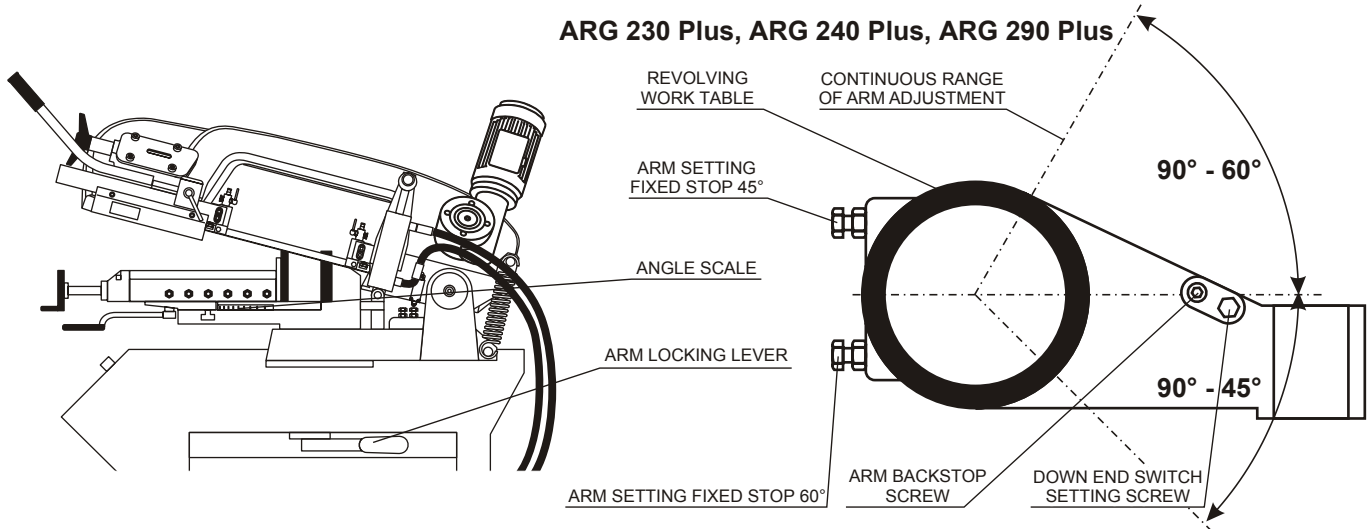
ARG 200 Plus, ARG 220 Plus



ARG 230 Standard, ARG 230, ARG 240 (60°)



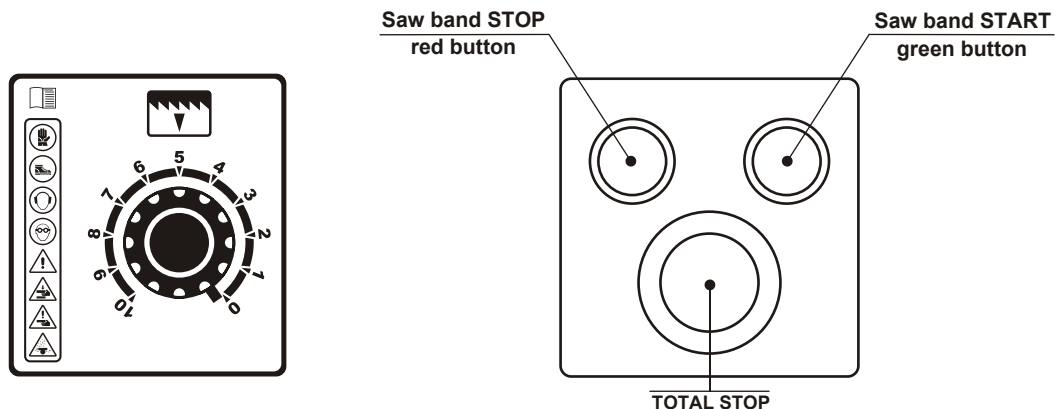
ARG 230 Plus, ARG 240 Plus, ARG 290 Plus





## 5.5. Control panel

### 5.5.1. Control panel ARG 180, ARG 200 Plus, ARG 220 Plus, ARG 230 Standard

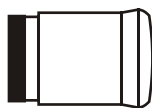


#### Basic functions



Before starting the band drive make always sure that the band is **NOT** in contact with the workpiece.

#### TOTAL STOP



Emergency stop of the main engine and coolant pump. The machine restart may be done only after manual unblock of the total stop button (BY PULL). **CAUTION : DANGER OF INJURY** - after switching the button the arm (with the band) stills moving down.

#### BAND SAW START - STOP



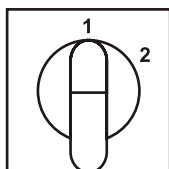
**START** Green button - starts the main engine and the coolant pump.



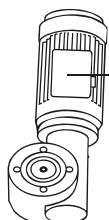
**STOP** Red button - stops the main engine and coolant pump. When starting the band drive the saw arm must be raised above the switching level of the down position end switch otherwise the band drive will **NOT** be started. **CAUTION : DANGER OF INJURY** - after switching the button the arm (with the band) stills moving down.

#### SPEED SWITCH

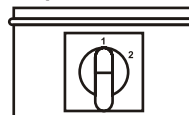
Cutting speeds can be changed by switch placed on the electrical box on the saw engine.



1 - 40 m/min  
2 - 80 m/min

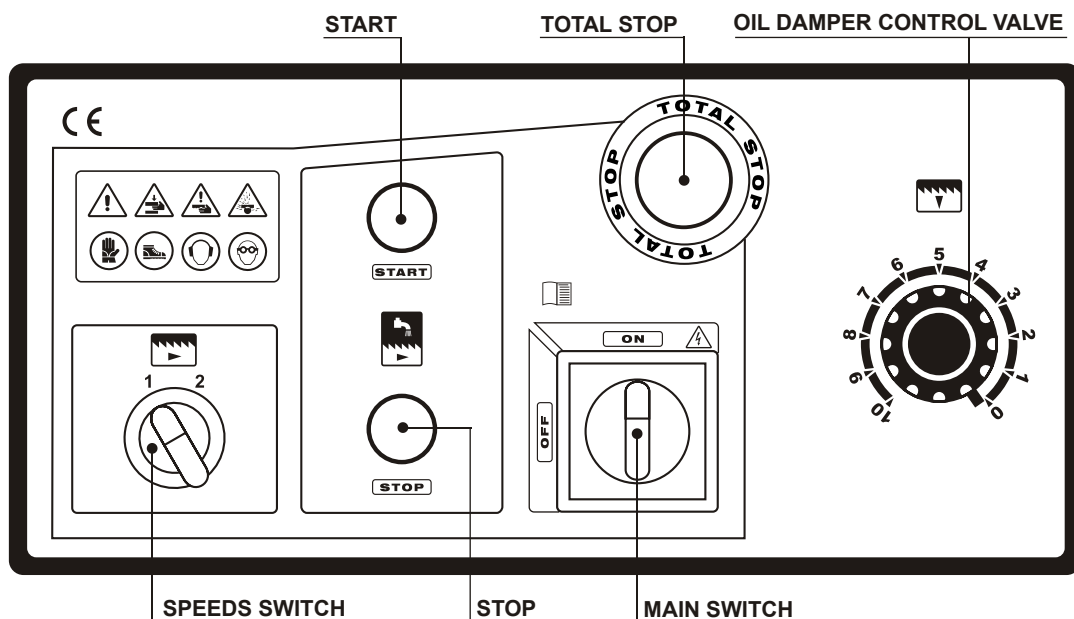


Speeds switch



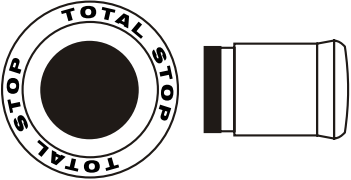


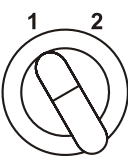



**CAUTION : Speeds may be changed only when the engine is stopped (saw band is not running)**

## 5.5.2. Control panel ARG 230, ARG 230 Plus, ARG 240, ARG 240 Plus, ARG 290 Plus

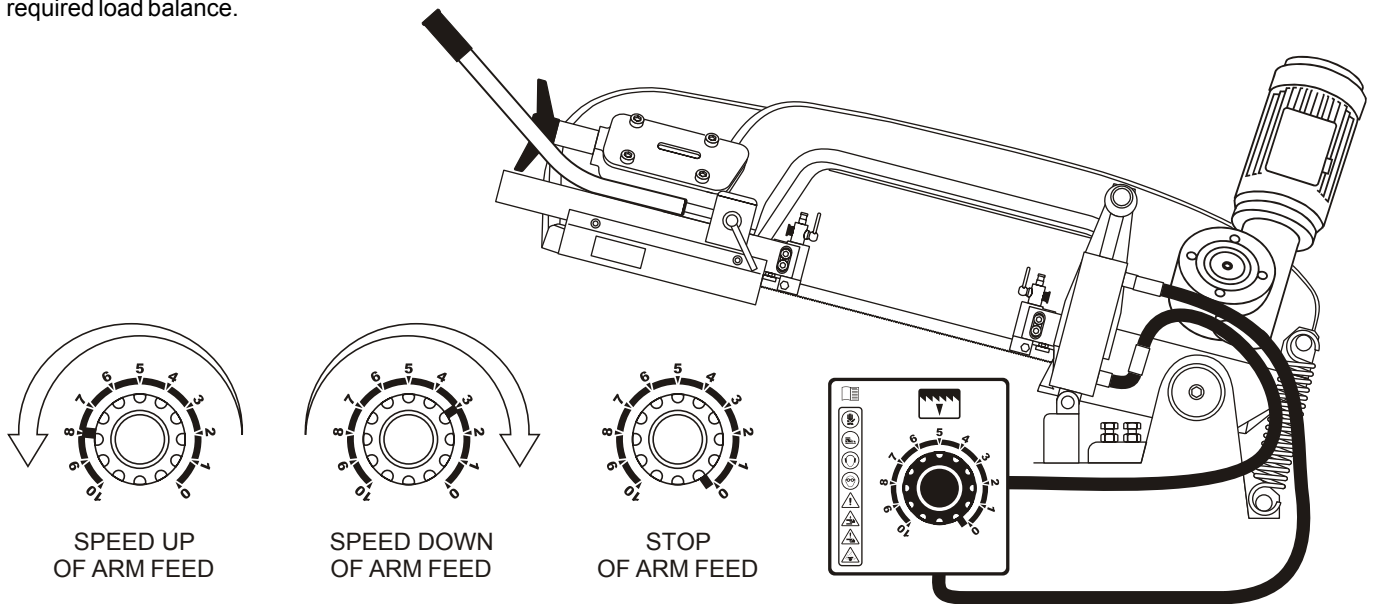


### Basic functions

<p><b>MAIN SWITCH</b></p>  <p>ON</p> <p>OFF</p>	 <p>Before starting the band drive make always sure that the band is <b>NOT</b> in contact with the workpiece.</p>
<p><b>TOTAL STOP</b></p>  <p>Emergency stop of the main engine and coolant pump. The machine restart may be done only after manual unblock of the total stop button (BY PULL). <b>CAUTION : DANGER OF INJURY</b> - after switching the button the arm (with the band) stills moving down.</p>	
<p><b>BAND SAW START - STOP</b></p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;">  <p><b>START</b></p>  <p><b>STOP</b></p> </div> <div> <p><b>Green button</b> - starts the main engine and the coolant pump. When starting the band drive the saw arm must be raised above the switching level of the down position end switch otherwise the band drivewill NOT be started.</p> <p><b>Red button</b> - stops the mainengine and coolant pump. <b>CAUTION : DANGER OF INJURY</b> - after switching the button the arm (with the band) stills moving down.</p> </div> </div>	
<p><b>SPEED SWITCH</b></p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;">  </div> <div> <p>Cutting speeds can be changed by a switch placed on the control panel on the machine base.</p> <p>1 - 40 m/min 2 - 80 m/min</p> </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <p><b>CAUTION : Speeds may be changed only when the engine is stopped (saw band is not running)</b></p> </div>	

## 5.6. Oil Damper - saw band feed into cut

The oil damper with a relief valve allow for a continuous adjustment of the speed of the band cutting feed or its stabilizing in any position. It acts against the arm weight being regulated by mechanical turning the lever over the scale. The tension spring acts as the required load balance.



## 5.7. Cooling equipment

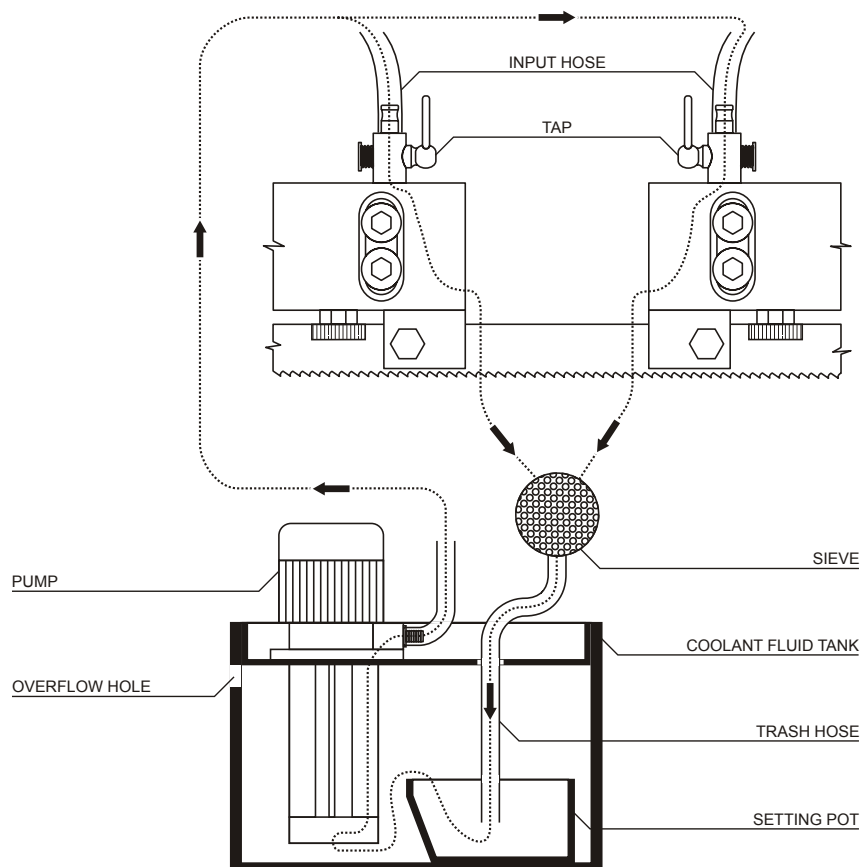
The basis of the cooling equipment is a pump and the coolant tray located in the machine base. The coolant tray can be taken out separately. The coolant pump conveys the coolant through hoses, valves and guide heads to the band. The coolant quantity is controlled by these valves. The coolant provides band cooling and lubrication and chip flushing. The pump switches on and off simultaneously with the band drive start or shutdown.



On the coolant tank is overflow hole which secure the proper quantity of coolant fluid. This is to protect the coolant pump from being overflow and damaged. In case of infusion of bigger volume the coolant fluid may run under the band saw.

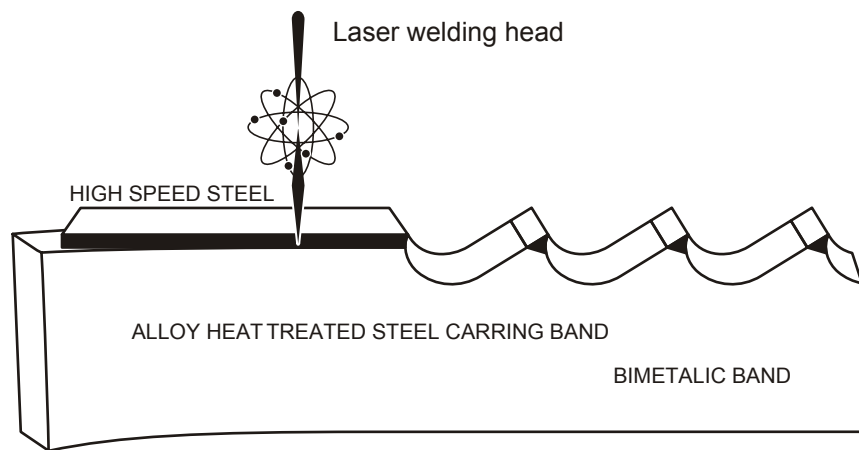


Hazards due to dangerous matters cannot be excluded while handling coolants. Observe the manufacturer's and/or your company's instructions and recommendations concerning handling of coolants.



## 6. Saw bands

### 6.1. Saw bands design



The precondition of the machine correct cutting power are high-quality bands. In order to achieve a high cutting power it is recommended to use bimetallic bands. The main band carrier is high-quality heat treated steel with a high limit of elasticity. The tooth edges are high-speed steel in the quality M 42.

M 42 - a band for universal use for cutting metallic and non-ferrous materials within the whole range of quality classes up to the hardness 45 Hrc. This band is suitable for cutting full materials of all sections and diameters, profiles, pipes and bundles.

M 51 - with refer to saw band M 42, the determination of M51 band is for cutting steels with hardness of 50 HRC, steels of higher steadiness classifications, stainless steels and acid proof steels. Also nickel, titan and special bronze alloys.

Hardmetal - High cutting performance against the bimetallic bands. Suitable for cutting steels and materials with high contain of nickel, chrome, wolfram, titan, stainless steels and surface hardened materials till hardness of 62 HRC. Saw bands may be used for all types of materials, including stainless steel, cast iron, plastic materials and materials with wood fibre. High heat conductivity and abrasion resistant of these bands gives them higher lifetime, cutting speed and productivity against bimetal bands.

Design: M 42 - Structure: W 2%, Mo 10%, V 1%, CO 8%, tooth hardness: 68 HRC. For cutting materials till hardness 45 HRC.

Design: M 51 - Structure: W 10%, Mo 4%, V 3%, CO 10%, tooth hardness: 69 HRC. For cutting materials till hardness 50 HRC.

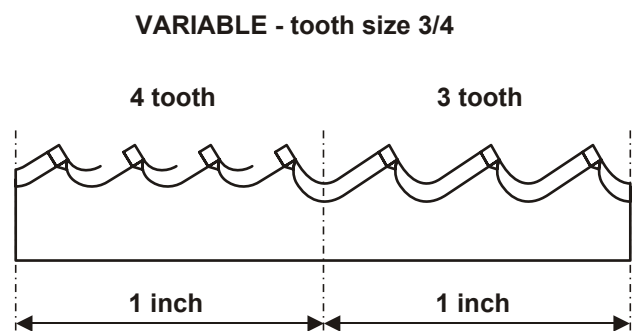
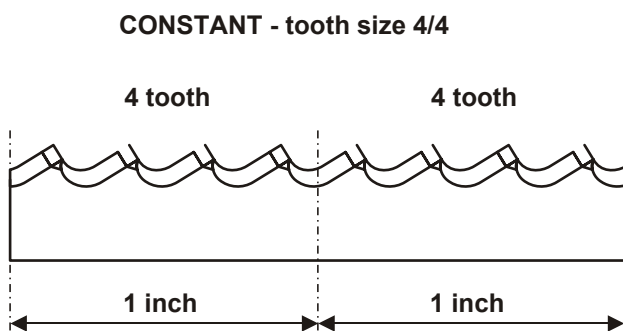
Design: Hardmetal - tooth hardness 1600 HV. For cutting materials till hardness 62 HRC

Except standard tooth shape and size, special corrected bands are manufactured with corrections like tooth distribution, tooth angle and shape of its face. This band may be applied on specific materials. Ask your bands distributor for advise.

#### Band Tooth Arrangement

a) Constant - tooth edge spacing always equal


b) Variable - tooth edge spacing is different repeating periodically. This modern band design allows for a bigger cutting range when one band type is being used, with the capability to eliminate vibrations due to the tooth edge striking the material and thus to achieve a clean smooth cut and a longer life.



## 6.2. Band tooth selection

Band tooth size selection has a great influence on the band lifetime.

### Recommended tooth sizes for cutting full materials

<b>PILOUS</b> 		ARG 180 13x0,9 (0,65)	ARG 180 13x0,65	ARG 200 20x0,9	ARG 200 20x0,9	ARG 220, 230, 240, 290 27x0,9		
Material section	Number of tooth / inch	Tooth quality M42/67-69 Hrc	Hardmetal 1600 Hr	Tooth quality M42/67-69Hrc	Hardmetal 1600 Hr	Tooth quality M42/67-69 Hrc	Tooth quality M51/69 Hrc	Hardmetal 1600 Hr
0-10	18z	(•)						
0-20	14z	• (•)		•		•		
0-30	10/14	• (•)		•		•		
20-50	8/12	• (•)		•		•		
30-50	8z					•		
25-60	6/10	• (•)		•		•		
50-80	6z	• (•)	•			•		
35-80	5/8			•		•		•
50-100	4/6			•		•	•	
80-120	4z	•	•	•		•		•
80-150	3/4					•	•	
120-200	3z	•	•	•	•	•		
120-350	2/3z					•		
200-400	2z					•		

When cutting profile materials the following table is recommended for one piece cutting. While cutting in bundles, it is necessary to count the wall thicknesses of all tubes in bundle and taking in consider their diameter.

### Recommended tooth sizes for cutting profile materials

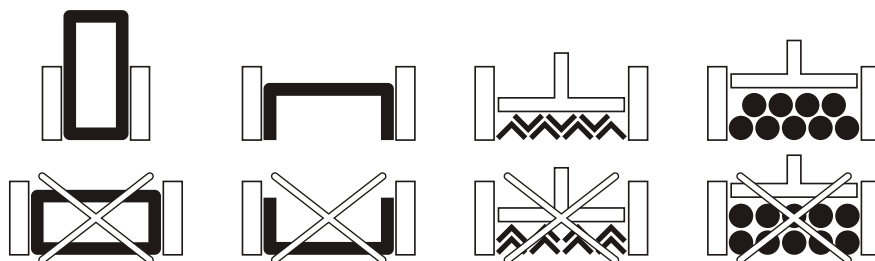
Wall thickness in (mm)	Tube diameter, diameter D (mm)							
	20	40	60	80	100	120	150	200
2	18	18	18	10/14	10/14	10/14	10/14	10/14
3	18	18	10/14	10/14	10/14	10/14	8/12	8/12
4	18	10/14	10/14	10/14	8/12	8/12	6/10	6/10
5	18	10/14	10/14	8/12	6/10	6/10	6/10	5/8
6	10/14	10/14	8/12	8/12	6/10	6/10	5/8	5/8
8	10/14	8/12	6/10	6/10	5/8	5/8	5/8	4/6
10	8/12	6/10	6/10	5/8	5/8	5/8	4/6	4/6
12	8/12	6/10	5/8	5/8	4/6	4/6	4/6	4/6
15	6/10	5/8	5/8	4/6	4/6	4/6	4/6	3/4
20	6/10	5/8	4/6	4/6	4/6	6	6	4
30	6/10	5/8	4/6	4/6	6	6	4	4

**Caution :** These values do not apply to cutting of other material profiles. This should be decided individually with respect to the profile form, the number of pieces in the bundle and the dimensions. Cutting of profile material will reduce the band life by up to one third due to the interrupted cut.

**Rule:** Minimally 4 tooth should be inside the workpiece when cutting but no more than 30 tooth

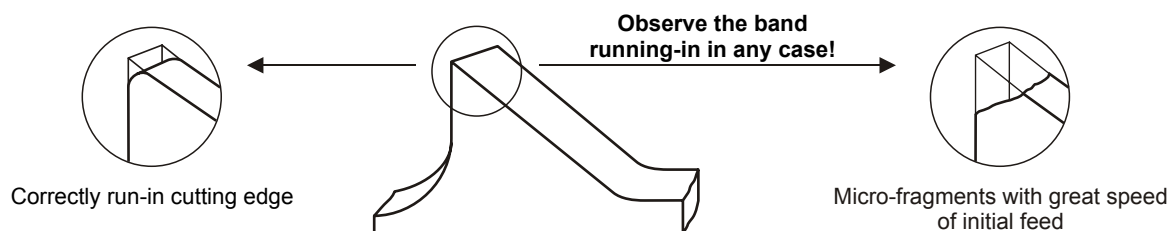
## 6.3. Workpiece clamping

The correct workpiece clamping can substantially influence the band life, the cut quality and precision allowing for a correct selection of the tooth size. To insure optimal cut, productivity and lifetime apply the following clamping methods :



## 6.4. Running-in the bands

The running-in applies to new bands. The high cutting power is possible because of the sharp cutting edges with extremely small edge radii. In order to achieve the maximum tool life, it is necessary to run in the band to the optimum. Depending on the correct cutting speed and the workpiece feed and its material quality the band must be run in only within 50 % of currently used feed. In this way the breaking of extremely sharp edges particularly with bigger sections of the work pieces will be avoided. These micro-fragments cause the destruction of further teeth. Should vibrations or sounds due to vibrations manifest itself when a new band has been put on, slightly reduce the cutting speed. In small workpiece sections it is recommended to run in the band with a reduced power for 15 minutes, in big sections for 30 minutes. Then increase the feed slowly to the optimum value.



## 6.5. Factors influencing band life

The band size / tooth size has not been appropriately selected for the workpiece • The band speed and the arm lowering speed into the cutting position are not appropriately selected • The band (the whole arm) bears against the material when the band is not in cutting position • The clamping of the profile material does not comply with the recommendation • The band is not correctly tensioned • The band is not correctly adjusted to the guide wheels (the band is driving against the wheel shoulders) • The guide head of the band is in a too big distance from the workpiece • Insufficient oil content in coolant • Incorrect running-in of the band • Insufficient maintenance of the bandsaw, insufficient cleaning of the arm from chips

**The above-mentioned shortcomings cause inaccuracy of the cut and a substantial reducing of the band life and/or its destruction.**

## 6.6. Recommended values for cutting

The values depend on the material class and its profile. Table of cutting speeds is only informative, in specific ranges it must be adapt to given material. ČSN numbers are informative and determine the material characteristics for which is the band type given.

Material		Recommended band speed in m/min for		Arm feed speed into cut in mm/min		Coolant oil content %
ČSN	Generally	Ø 0-100 mm	Ø 100-290 mm	Ø 0-100 mm	Ø 100-290 mm	
11 107 - 11 110	Free machining steels	70-90	70-90	190-60	55-20	10-15
11 301 - 11 420 / 12 010 - 12 020	Structural steel	60-90	60-80	190-60	55-30	10-15
11 500 - 11 600 / 12 020 - 12 060	Case-hardening steel	60-90	50-70	125-38	35-25	10-15
13 250 / 14 260 / 15 260	Spring steel	50-70	40-60	125-30	28-15	5-10
14 100 / 15 220	Bearing steels	50-70	30-60	125-30	28-15	3
14 220 / 15 124	Alloy steel	50-80	40-70	125-35	30-20	10
17 020 - 17 042	NIRO steels	40-50	30-40	75-15	12-4	10-15
17 115	Ventil steels	40-60	30-50	90-23	21-10	3
17 253 - 17 255	Heat-resistant steels	30-40	30	40-7	6-1	15
19 063 - 19 083 / 15 142 / 16 142	Heat treatment steels	60-90	40-70	125-35	30-25	5-10
19 150 / 19 192 - 19 312	Simple steel	50-70	30-60	120-25	20-8	5-10
19 422 / 19 452 / 19 721 / 19 740	Alloy steels	40-50	30-50	100-20	18-2	5-10
19 436	Hammer materials	30-40	30-40	62-15	14-5	No coolant
19 662	Nitriding steels	40-50	30-40	76-25	23-12	5
19 721	Tool steels for in heat work	30-40	30	70-1	16-6	5
19 802 - 19 860	Rapid steels	40-60	30-50	90-23	21-10	3
INCONEL, HASELLOY, NIMONIC, INCOLOY		30	30	25-5	4-2	15-20
Heat treated steel 1000 - 1500 N/mm		30	30	25-5	4-2	15-20
Cast steel		30-70	30-60	190-60	55-25	40
Gray iron		40-80	30-70	190-60	55-30	No coolant
Cooper, bronze, tin bronze		70-90	60-90	300-90	85-55	3
Red bronze		70-90	60-90	230-75	70-45	10
Aluminium bronze		40-70	30-60	230-75	70-45	10-15
Cast from Al alloys		80-90	80-90	450-150	140-55	25
Al 99 %, thermoplastics, plastic materials		50-90	50-80	450-150	140-55	No coolant



## 7. Putting Into operation

### 7.1. Safety Control

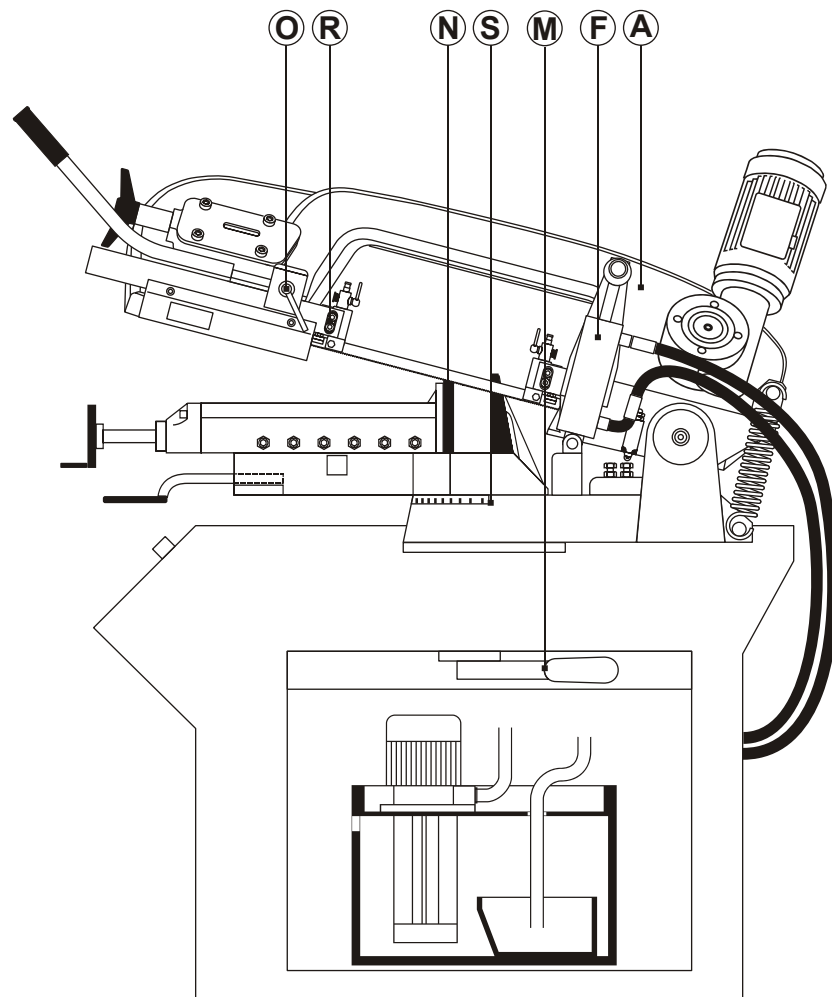


Is everything in perfect condition as far as technical safety is concerned?  
Have all covers been properly fitted?

### 7.2. First cut



**Caution! Danger of injury!**  
The band is not covered in the machining zone.



When starting to work with the band saw make sure that the TOTAL STOP button is unblocked. Loose WORKTABLE LEVER (M) , raise the saw arm (A) to upper max. position and by turning the saw arm with refer to angle scale set requested cutting angle and tighten the WORKTABLE LEVER (M) again. Move up the saw arm (saw band) by 20 - 30 mm above the workpiece expected height and fix it by closing the valve of the OIL DAMPER (F). Open MOVING JAW (N) with VICE HANDLE WHEEL (L) in order to put the workpiece between clamping jaws. Feed in the workpiece. Long and heavy work pieces are hardly being set in correct position by the moving jaw. It is necessary to adjust them accordingly after feed in. Asymmetric or thin-walled profiles are stabilized and fixed in position by shaped pieces, e.g. hard wood shaped pieces, etc. Select workpiece length. Move the MOVING JAW (N) with VICE HANDLE WHEEL and close by QUICK CLAMPING LEVER. Set the correct distance between the moving guiding head and workpiece approx. 5 - 10 mm and lock by CLAMPING LEVER (O). Select cutting speed. Start band drive. By control valve adjust the arm feed speed into cut. Optimal value can be set by hearing no high voices and vibrations. This can be achieved by increasing or decreasing the feed into cut. The optimal feed depends on correct teeth and cutting speed selection. When cut is finished the band must automatically stop. First cut was done. The arm is now in the down end position.

## 8. Machine maintenance

### 8.1. Maintenance and control



**Caution! Danger of injury**

**Carry out maintenance only with the main switch off or with the machine cut off the mains.**

For maintaining the efficiency of the machine and its components it is unconditionally necessary to carry out the maintenance of the machine which includes: machine cleaning • metal chips removing • coolant exchange • lubrication of sliding and guiding surfaces • checking of connecting cables for damage • vice control



**Checking of Protective Covers**

Check the protective covers of the machine for damage and failures in regular intervals (at least once a week).



**Checking of Connecting Cables**

Check the connecting cables for intactness in regular intervals - at least once a week.

#### **Machine Cleaning**

Clean the machine thoroughly in regular intervals (at least once a week). Use appropriate cleaning agents. Do not use solvents (e.g. nitrosolvent) for machine cleaning. Do not use compressed air for machine cleaning! Otherwise the fine chips and impurities will penetrate under the sliding elements.

#### **Chips removal / liquidation.**



**Observe the instructions and recommendations related to safe disposal of service waste.**

Correct cutting angles will be achieved when the bearing surfaces for the workpiece and the jaws are free from metal chips and other impurities.

#### **Coolant unit cleaning**



**Hazards due to dangerous matters cannot be excluded while handling coolants. Observe in your own interest the manufacturer's and/or your company's instructions and recommendations concerning safe handling of coolants.**

The coolant tray may be taken out of the machine base for maintenance and cleaning. The pump is limited by the length of the connecting cable and the coolant piping. **Caution: Used up coolants are special waste!**

**Our recommendations:** Regular cleaning and maintenance of the coolant aggregate increase the coolant pump life and functionality. Use water-mixable coolants, if possible, not irritating the skin with high anti-ageing and anti-corrosion protection. Check the coolant oil content at least once a week. Optimum cooling sufficiently increases the band life.

#### **Lubrication:**

Regular lubrication and cleaning increase the machine lifetime and its function. When making ordinary machine checking make sure that frictional surfaces and vice screw are well lubricated.

### 8.2. Repairs



**Caution! Danger of injury!**

**Repairs may only be carried out when the main switch is off and secured against switching on or when the machine is cut off the mains.**

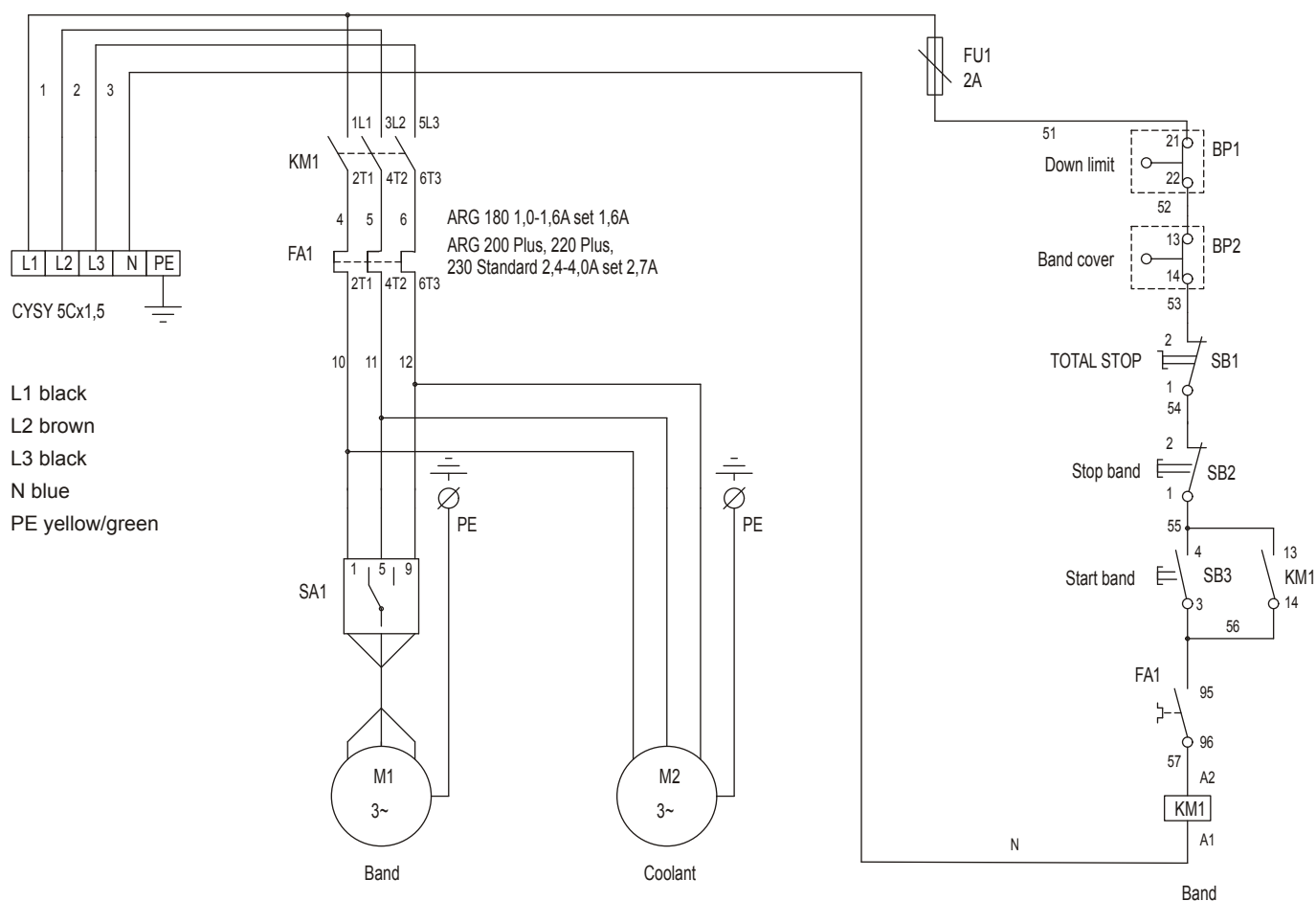
## 9. Errors - reasons and elimination

Error	Possible error reason	Error elimination
NOT possible to start band motor	<ul style="list-style-type: none"> <li>• Main switch is not switched ON</li> <li>• TOTAL STOP button is blocked (pressed)</li> <li>• Premium overcurrent relay is off</li> <li>• Band cover safety switch is not switched</li> <li>• Burned fuse inside the control panel</li> <li>• Arm is in down feed position, limit switch is still pressed</li> </ul>	<ul style="list-style-type: none"> <li>• Switch main switch ON</li> <li>• Unblock TOTAL STOP button</li> <li>• Test the overcurrent relay of motor</li> <li>• Control band cover</li> <li>• Change the fuse</li> <li>• Move arm approx. 30 mm up to workpiece</li> </ul>
Motor is ON, saw band NOT turning	<ul style="list-style-type: none"> <li>• Band is slipping on driving wheel</li> <li>• Band is broken</li> <li>• Other gearbox error</li> </ul>	<ul style="list-style-type: none"> <li>• Tension the band properly</li> <li>• Change the band</li> <li>• Call the service technician</li> </ul>
Coolant skips	<ul style="list-style-type: none"> <li>• No coolant left inside the cooling system</li> <li>• Coolant tank, connections or taps are dirty</li> <li>• Broken coolant pump</li> </ul>	<ul style="list-style-type: none"> <li>• Control the coolant fluid</li> <li>• Clean coolant tank, connections and taps</li> <li>• Change coolant pump</li> </ul>
Vibrations during cutting	<ul style="list-style-type: none"> <li>• Incorrect arm feed speed</li> <li>• Incorrect band teeth pitch</li> <li>• Incorrect setting of band guiding heads, hard metals or bearings</li> <li>• Incorrect material clamping</li> </ul>	<ul style="list-style-type: none"> <li>• Set the arm feed speed 5% less / more</li> <li>• Control the teeth size and pitch</li> <li>• Adjust correctly see chapter 5.3.</li> <li>• Control the material clamping</li> </ul>
Broken teeth inside the cutting hollow of the material		<ul style="list-style-type: none"> <li>• Start new cut</li> <li>• Do not use new band in old hollow it will be damaged during the first cut</li> </ul>
Cut is NOT rectangular	<ul style="list-style-type: none"> <li>• Not correct cutting angle</li> </ul>	<ul style="list-style-type: none"> <li>• See chapter 5.4.</li> </ul>
Saw bad cut is not square	<ul style="list-style-type: none"> <li>• Blunt saw band</li> <li>• Incorrect teeth size</li> <li>• High speed of arm feed into cut</li> <li>• Band slipped from guiding bearings</li> <li>• Clearance of hard metal guidance</li> <li>• Workpiece is not placed horizontally in the vice against the working table</li> </ul>	<ul style="list-style-type: none"> <li>• Put new saw band</li> <li>• Check correct teeth size see chapter. 6.2.</li> <li>• Adjust the correct feed speed</li> <li>• Adjust saw band correctly see chapter. 5.2.</li> <li>• Adjust them see chapter 5.3.</li> <li>• Adjust the roller conveyor</li> </ul>
Saw band breaking between tooth	<ul style="list-style-type: none"> <li>• Incorrect teeth size</li> <li>• High speed of arm feed into cut</li> <li>• Incorrect adjustment of hard metal guidance inside guiding heads</li> <li>• The moving guiding head is too far from the workpiece</li> <li>• Not enough cooling</li> </ul>	<ul style="list-style-type: none"> <li>• Check correct teeth size see chapter. 6.2.</li> <li>• Adjust the correct feed speed</li> <li>• Adjust them see chapter 5.3.</li> <li>• Move it closer, see chapter 5.1.</li> <li>• Increase the coolant fluid inflow</li> </ul>
Saw band breaking from the top	<ul style="list-style-type: none"> <li>• Incorrect band adjustment on the running wheels</li> <li>• Incorrect tooth size</li> <li>• High speed of arm feed into cut</li> <li>• Incorrect adjustment or break of hard metal guidance or bearings inside guiding heads</li> <li>• The moving guiding head is too far from the workpiece</li> </ul>	<ul style="list-style-type: none"> <li>• See chapter 5.2.</li> <li>• See chapter 6.2.</li> <li>• Regulate the feed</li> <li>• See chapter 5.2.</li> <li>• Move it closer 5.1.</li> </ul>
Non-uniform motion of arm feeding	<ul style="list-style-type: none"> <li>• Oil deficit</li> </ul>	<ul style="list-style-type: none"> <li>• Call Customer service</li> </ul>
Arm is feeding even if regulation valve is tighten	<ul style="list-style-type: none"> <li>• M4 lock screw of control valve wheel is loose - turns through</li> <li>• Valve seat is worn out</li> <li>• Cylinder sealing is worn out</li> <li>• Valve failure (impurities)</li> </ul>	<ul style="list-style-type: none"> <li>• Tighten M4 lock screw</li> <li>• Loosen M4 lock screw, turn wheel through approx. 10° to the left and tighten.</li> <li>• Contact service center</li> <li>• Contact service center</li> </ul>

**The adjustment of guiding head is a matter of permanent maintenance of the machine. This defect is NOT included in the warranty.**

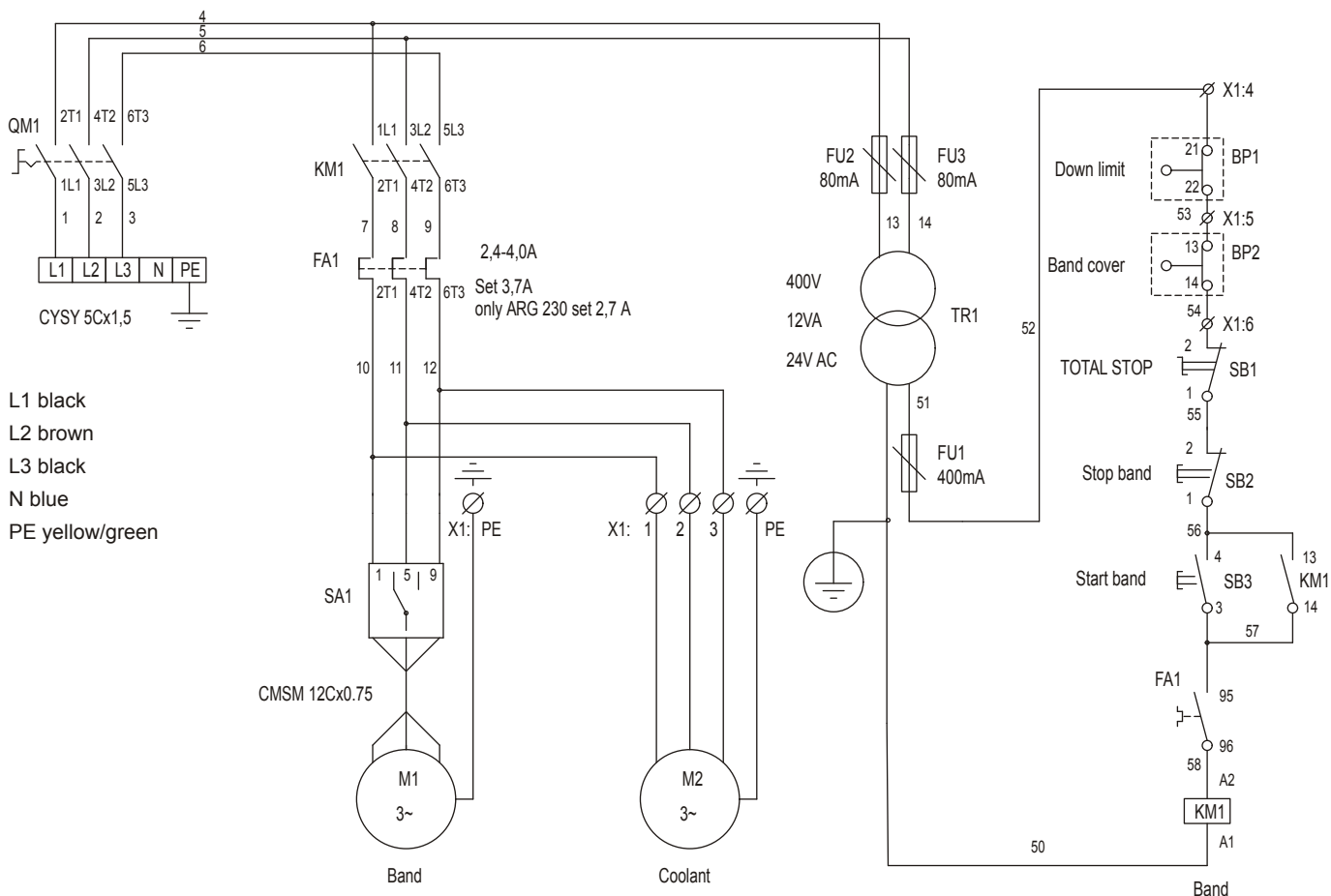
## 10. Electrical scheme and device lay-out

### 10.1. Electrical scheme ARG 180, 200 Plus, 220 Plus, 230 Standard



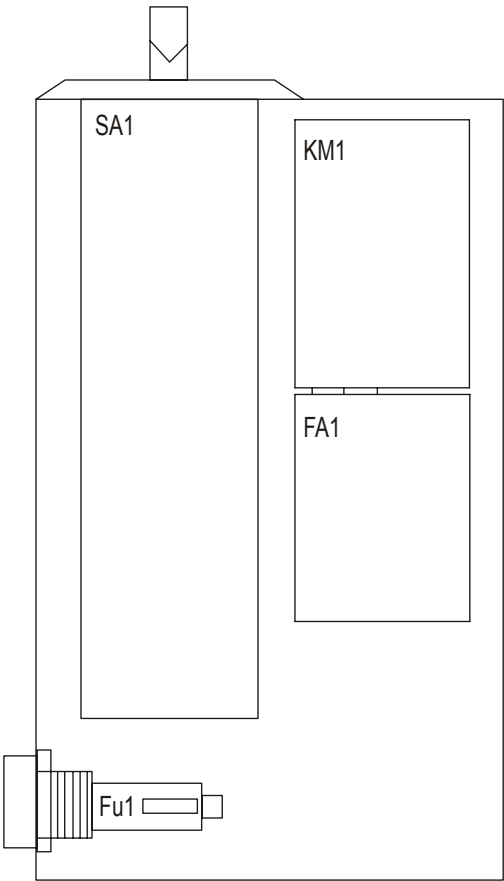
Scheme:	Name:	Type:	Manufacturer:	Order number
SA1	Motor speed switch M1	ON 12PBS 5252	ABB	002516
BP1	Down limit end switch	FR6A1	Pizzato	002490
BP2	Band cover safety switch	FR6A1	Pizzato	002490
KM1	Mini-contactor	B6-30-10 220-240VAC	ABB	002388
FA1	Thermal relay	T7 DU 1,6A	ABB	002124 ARG 180
	Thermal relay	T7 DU 4,0A	ABB	002480 ARG 200, 220, 230
FU1	Fuse carrier	PTF 30	Vd Bečov	001587
	Fuse	2A	OMEGA	001597
SB1	mo aret. Switch head red	M22-PV/K01	MÖELLER	006104
SB2	mo press head red	M22-D-R	MÖELLER	006086
	mo connecting part for head	M22-A	MÖELLER	006103
	mo switch unit 1 off	M22-K01	MÖELLER	006091
SB3	mo aret. Switch head green	M22-D-G	MÖELLER	006087
	mo connecting part for head	M22-A	MÖELLER	006103
	mo switch unit 1 on	M22-K10	MÖELLER	006090
M1	el. engine ARG 180	SRS 40 i =20 AC, Sg 71 4/2 0,3/0,45kW	Elektrophony Frenštát	007945
	el. engine ARG 200 Plus	SRS 50 i =28 AC24, SKh-80 4/2 0,75/0,95kW	Elektrophony Frenštát	006586
	el. engine ARG 220 Plus	SRS 60 i =28 AC, SKh-80 4/2 0,75/0,95kW	Elektrophony Frenštát	007639
	el. engine ARG 230 Standard	SRS 60 i =28 AC, SKh-80 4/2 0,75/0,95kW	Elektrophony Frenštát	007639
M2	Coolant pump	SACEMI PA35 "NC" 230/400V	Sacemi	006468
		2COP1-17HP1-4 3/2V 50 380V	EMP SLAVKOV	006645

## 10.2. Electrical scheme ARG 230, ARG 230 Plus, ARG 240, ARG 240 Plus, ARG 290 Plus

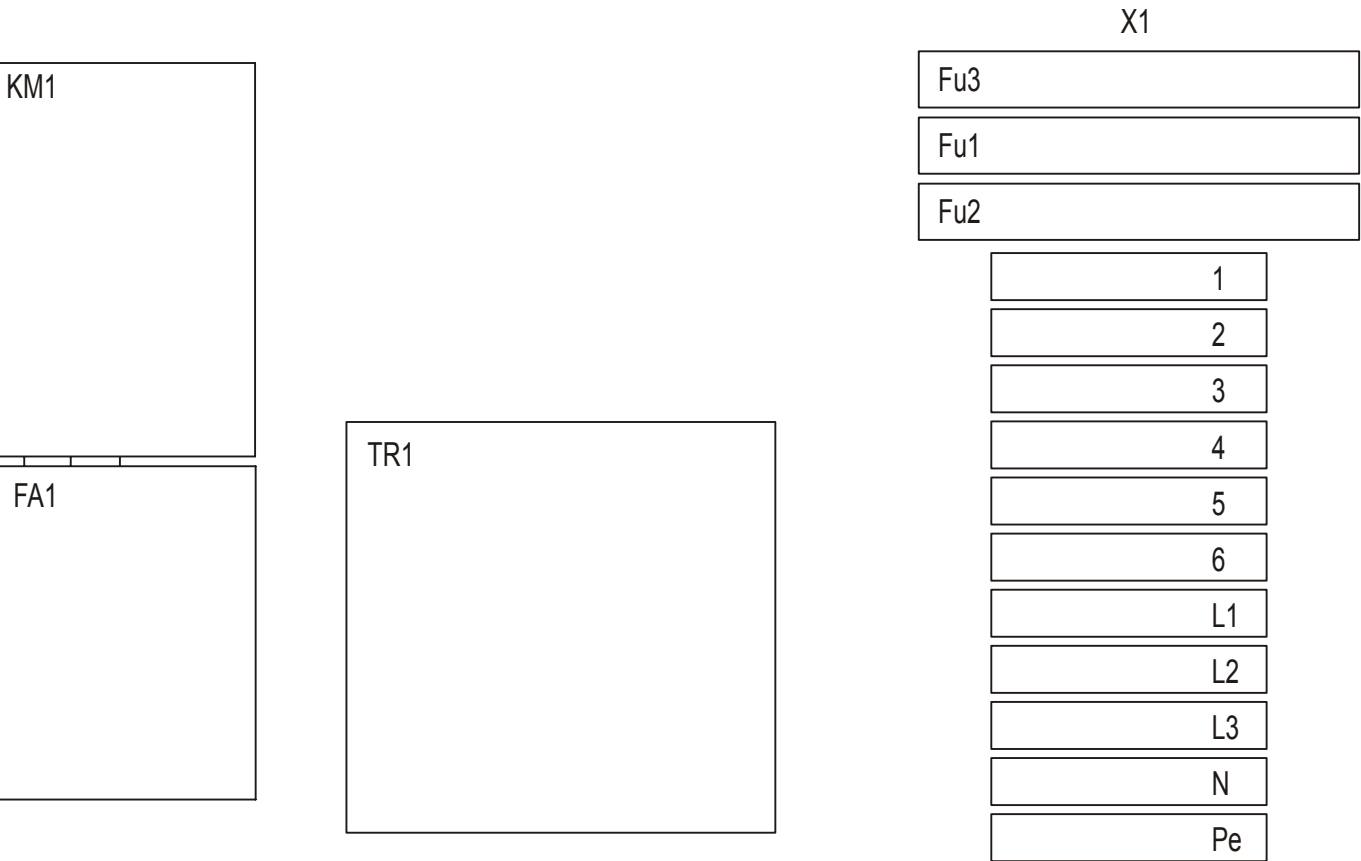


Scheme:	Name:	Type:	Manufacturer:	Order number:
SA1	Motor speed switch M1	ON 8 XBS 7638	ABB	009655
BP1	Down limit end switch	FR6A1	Pizzato	002490
BP2	Band cover safety switch	FR6A1	Pizzato	002490
KM1	Mini-contactor	B6-30-10 24VAC	ABB	002426
FA1	Thermal relay	T7 DU 4,0A	ABB	002480
FU1	Fuse carrier	PTF 30	Vd Bečov	001587
	Fuse	400mA	OMEGA	001971
FU2	Fuse carrier	PTF 30	Vd Bečov	001587
	Fuse	80mA	OMEGA	001987
FU3	Fuse carrier	PTF 30	Vd Bečov	001587
	Fuse	80mA	OMEGA	001987
SB1	mo aret. Switch head red	M22-PV/K01	MÖELLER	006104
	mo press head red	M22-D-R	MÖELLER	006086
	mo connecting part for head	M22-A	MÖELLER	006103
	mo switch unit 1 off	M22-K01	MÖELLER	006091
SB3	mo press head green	M22-D-G	MÖELLER	006087
	mo connecting part for head	M22-A	MÖELLER	006103
	mo switch unit 1 on	M22-K10	MÖELLER	006090
QM1	switch	OT 16 ET3	ABB	002861
	switch OT - accessories	OTS 32 T 3	ABB	002863
	switch OT - accessories	OHY2PJ	ABB	003523
TR1	insulating transformer	12VA 400/24V	Elektrov Znojmo	001899
M1	el. engine ARG 230, 240	SRS 70, i = 28AC30 STKg-80x 4/2 0,9/1,4kW	Elektrophony Frenštát	007640
	el. engine ARG 290	SSRS 85, i = 20 SSKg-100Lx 6/4b 0,9/1,7kW	Elektrophony Frenštát	006570
M2	Coolant pump	SACEMI PA35 "NC" 230/400V	Sacemi	006468
		2COP1-17HP1-4 3/2V 50 380V	EMP SLAVKOV	006645

10.3. Electrical device lay-out ARG 180, ARG 200 Plus, ARG 220 Plus, ARG 230 Standard



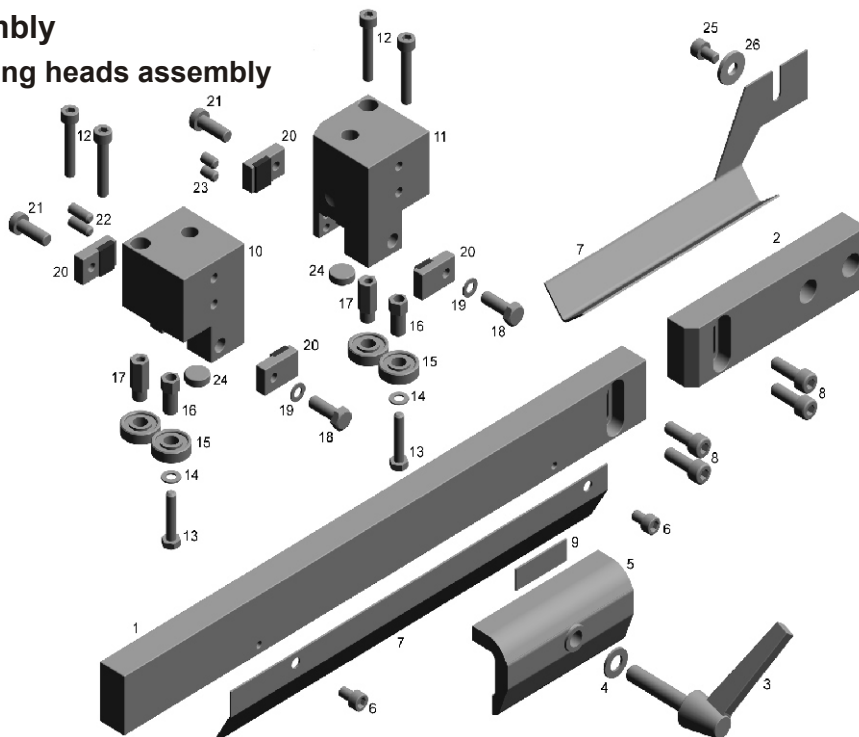
10.4. Electrical device lay-out ARG 230, ARG 230 Plus, ARG 240, ARG 240 Plus, ARG 290 Plus





## 11. Assembly

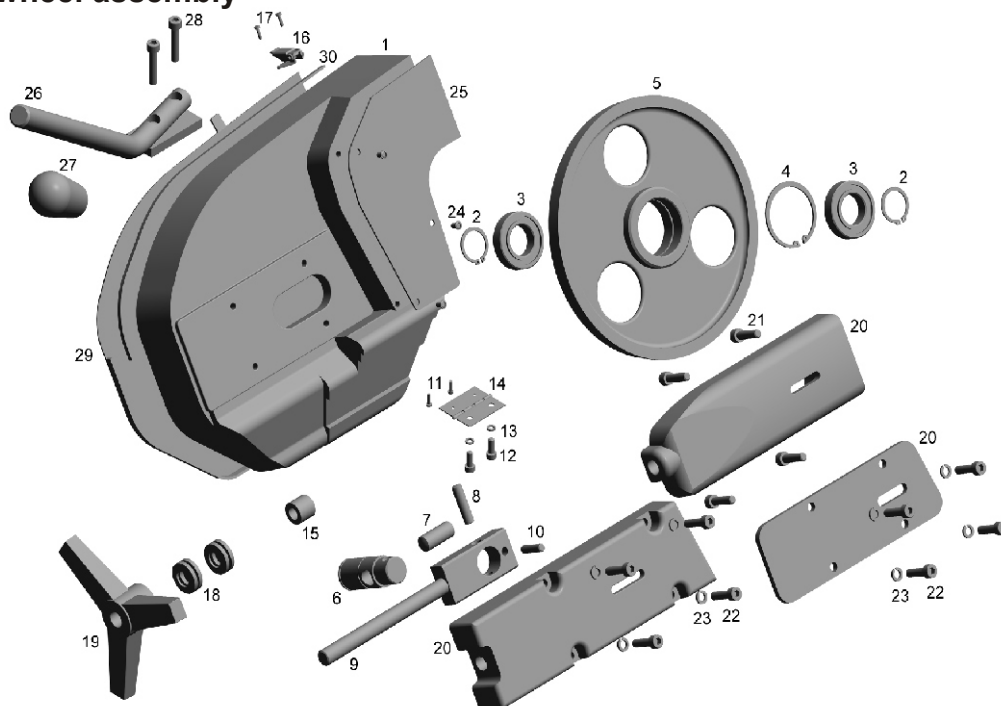
### 11.1. Guiding heads assembly



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Pos.	Ordering number	Name	Type ARG	pcs	Pos.	Ordering number	Name	Type ARG	pcs
1	002255	front guiding bar	180	1	11.	001346	Back guiding head	220,230	1
	004501	front guiding bar	200	1		002163	Back guiding head	240	1
	001492	front guiding bar	220,230	1		002193	Back guiding head	290	1
	002182	front guiding bar	240	1	12	002709	screw M5×45	180,290	2
	004055	front guiding bar	290	1		003642	screw M5×35	200	2
2	002366	back guiding bar	180	1		001439	screw M5×40	220,230,240	2
	003487	back guiding bar	200	1	13	002404	screw SW M5×20	200	2
	002183	back guiding bar	220,230,240,290	1		001452	screw SW M5×25	220,230,240,290	2
3	009055	lever - adjustable M 8x45	180,200	1	14	001473	washer 6	220,230,240,290	2
	001649	lever - adjustable M 12x50	220,230,240,290	1	15	001547	bearing 625 2Z	180	4
4	001474	washer 8	180,200	1		002262	bearing 607 2Z	200	4
	001475	washer 12	220,230,240,290	1		001405	bearing 609 2Z	220,230,240,290	4
5	004301	clamp - plastic	180,200	1	16	001517	small tappet	180	2
	004302	clamp - plastic	230	1		002238	small tappet	200	2
	001344	clamp - cast	240,290	1		001347	small tappet	220,230,240,290	2
	002354	clamp - cast	220	1	17	001518	big tappet	180	2
6	001886	screw M5×10	180	2		002239	big tappet	200	2
	001442	screw M6×12	220,230,240,290	2		001348	big tappet	220,230,240,290	2
7	002257	guiding bar cover	180	1	18	001561	screw M6×20	180,200	2
	005427	band front cover	200	1		001454	screw M8×25 SW	220,230,240	2
	001343	guiding bar cover	230 STANDARD	1		001717	screw M8×30 SW	290	2
	001505	guiding bar cover	230-290	1	19	001474	washer 8	220,230,240,290	4
8	001561	screw M6×20	180,200	4	20	001519	hard metal plate	180	4
	001441	screw M8×20	220,230,240,290	4		002357	hard metal plate	200	4
9	002375	band direction label	180	1		001349	hard metal plate	220,230,240,290	4
	003500	band direction label	200	1	21	001824	screw M6×10 NH	180,200	2
	009318	band direction label	220	1		001673	screw M8×12 NH	220,230,240,290	2
	001420	band direction label	230	1	22	002387	adjustable screw M5×8	180	1
	002144	band direction label	240	1		002387	adjustable screw M5×8	200	2
	002145	band direction label	290	1		001457	adjustable screw M6×12	220,230,240,290	2
10	002253	front guiding head	180	1	23	002387	adjustable screw M5×8	180	1
	002972	front guiding head	200	1		002387	adjustable screw M5×8	200	2
	001345	front guiding head	220,230	1		001924	adjustable screw M6×6	220,230,240,290	2
	002162	front guiding head	240	1	24	001351	hard metal KR 12x4	180-290	2
	002192	front guiding head	290	1	25	002743	screw fl. M5×10	180,200	1
11	002254	back guiding head	180	1	26	001472	washer 5	180,200	1
	002973	back guiding head	200	1					

## 11.2. Idler wheel assembly

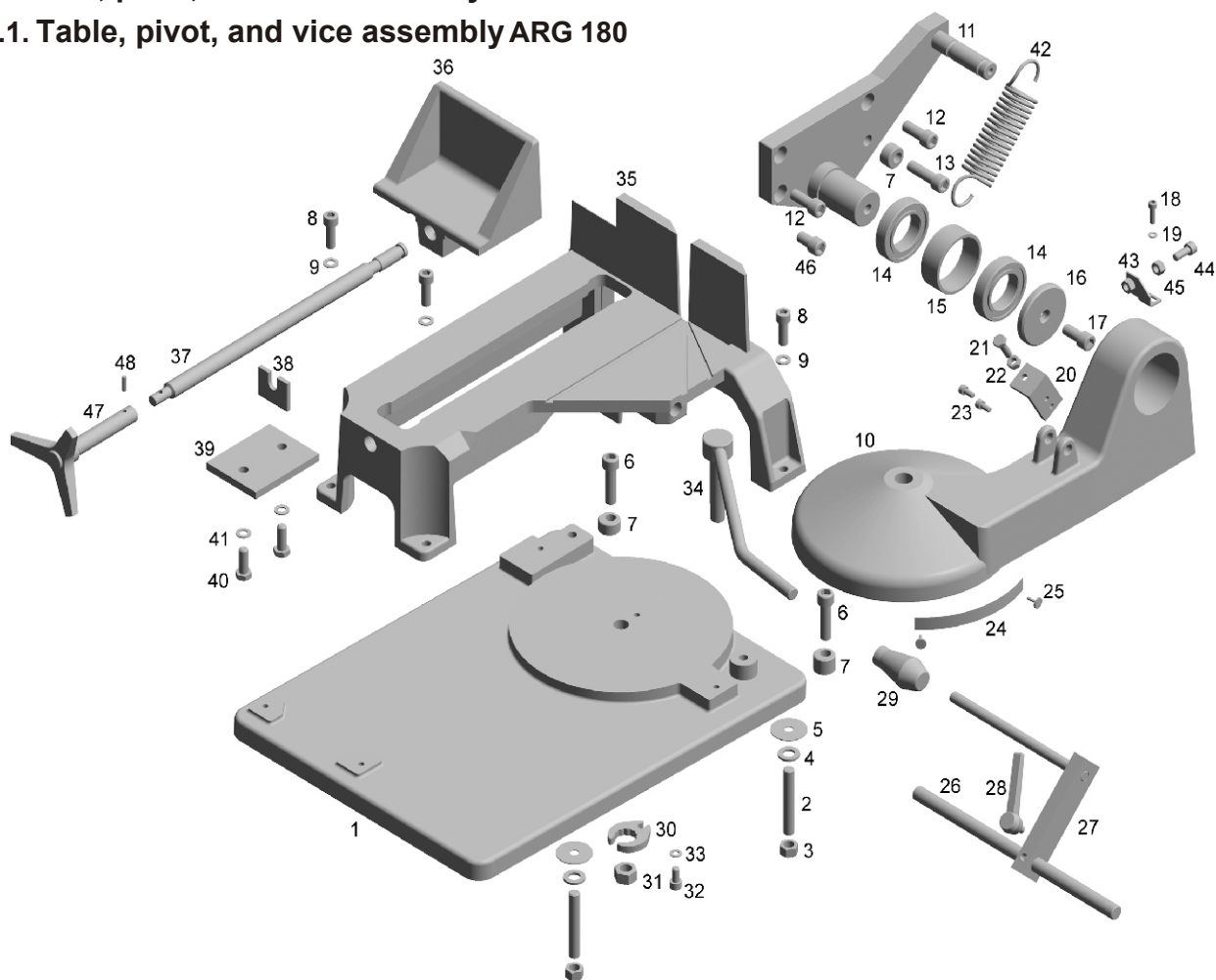


ver. 2.7.2004

Pos.	Ordering number	Name	Type ARG	pcs	Pos.	Ordering number	Name	Type	pcs
1	007586	bow (arm) SRS40	180	1	17	001489	parker 3×10	240,290	8
	006013	bow (arm) SRS50	200	1	18	003825	TP 31,5×16,3×0,8×1,9	180	10
	007793	bow (arm) SRS60	220	1		003826	TP 31,5×16,3×1,2×2,1	200,220	10
	001336	bow (arm) SRS60	230	1		001483	TP 31,5×16,3×1,8×2,5	230,240,290	10
	007585	bow (arm) SRS70	240	1	19	005140, 001340	handle star plastic, metalic	180-290	1
	002131	bow (arm) SRS85	290	1	20	002307	arm (bow) cover	180	1
2	001432	snap ring - outer KR 30	180-290	2		002974	arm (bow) cover	200,220	1
3	001404	bearing 6006 2Z	180,200	2		001337	arm (bow) cover	230	1
	001626	bearing 6206 2Z	220-290	2		008632	arm (bow) cover	240	1
4	001436	snap ring - inner KR 55	180,200	1		002154	arm (bow) cover	290	1
	001437	snap ring - inner KR 62	220-290	1	21	001443	screw M8×25	230	4
5	002272	tensioning (idler) wheel	180	1	22	001678	screw M8×20 NH	180,200,220	4
	002971	tensioning (idler) wheel	200	1		001678	screw M8×20 NH	240	6
	001670	tensioning (idler) wheel	220,230,240	1		001976	screw M8×30	290	4
	002161	tensioning (idler) wheel	290	1	23	001479	washer - flexible 8	180,290	4
6	002235	tensioning plug	180,200	1		001479	washer - flexible 8	200,220,240	6
	001339	tensioning plug	220,230,240	1	24	002743	screw fl. M5×10	200,220,240,290	7
	002181	tensioning plug	290	1	25	002975	bow front cover	200	1
7	001485	cylindrical pivot 16×40	180-290	1		008156	bow front cover	220	1
8	001484	cylindrical pivot 10×40	180,200,220	1		002175	bow front cover	240	1
	002384	cylindrical pivot 10×45	230,240,290	1		002190	bow front cover	290	1
9	002295	tensioning plate + spiral	180	1	26	004498	lever	180,200	1
	002991	tensioning plate + spiral	200,220	1		001341	lever	220,230,240,290	1
	002157	tensioning plate + spiral	230,240,290	1	27	001391	rubber handle	180-290	1
10	001459	adjustable screw M8×25	180-290	1	28	001618	screw M8×40	180,200,220	2
11	002381	rivet 4x10 Al.	180-220	4		001444	screw imbus M8×40	230,240,290	2
	002381	rivet 4x10 Al.	240,290	2	29	002368	bow cover	180	1
12	001442	screw M6×12	180-220	4		002976	back bow cover	200	1
	001442	screw M6×12	240,290	2		008157	back bow cover	220	1
13	001573	washer - flexible 6	180-220	4		001619	bow cover	230	1
	001573	washer - flexible 6	240,290	2		002176	back bow cover	240	1
14	002380	back arm cover hinge	180-220	2		002191	back bow cover	290	1
	002380	back arm cover hinge	240,290	1	30	007324	protective creeling 12 mm	180,200	1
15	006630	midst ring	180,200,220	1		007324	protective creeling 12 mm	220	1
16	002108	toggle latch	180-230	2		007324	protective creeling 12 mm	230	1
	002108	toggle latch	240,290	4		007324	protective creeling 12 mm	240	1
17	001489	parker 3×10	180-230	4		007324	protective creeling 12 mm	290	1

## 11.3. Table, pivot, and vice assembly

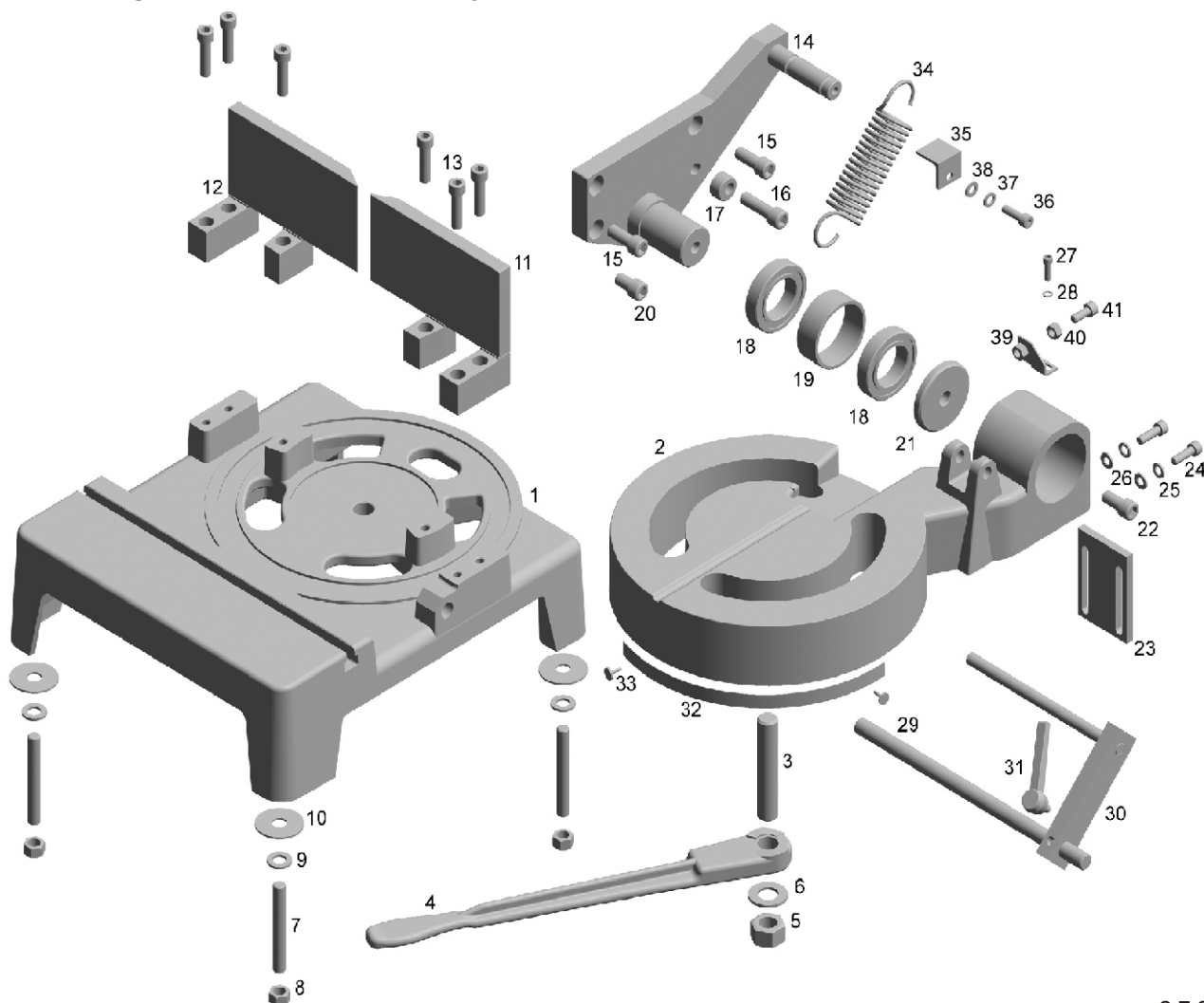
### 11.3.1. Table, pivot, and vice assembly ARG 180



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Pos.	Ordering number	Name	Type ARG	pcs	Pos.	Ordering number	Name	Type ARG	pcs
1	004723	table	180	1	28	001418	lever M8×15	180	1
2	005884	stud bolt M10×80	180	4	29	001580	conical handle M12	180	1
3	001469	nut M10	180	4	30	001534	star	180	1
4	001476	washer 10	180	4	31	001570	nut M16	180	1
5	005643	sealing	180	4	32	001562	screw M8×16	180	1
6	001564	screw M12×30	180	2	33	001479	washer - flexible 8	180	1
7	001579	distance eccentric large	180	3	34	005712	lever with screw	180	1
8	001443	screw M8×25	180	4	35	009453	vice body	180	1
9	001474	washer 8	180	4	36	009454	vice grip	180	1
10	004721	turning table	180	1	37	009426	trapezial screw	180	1
11	002349	pivot	180	1	38	009455	stirrup	180	1
12	001564	screw M12×30	180	2	39	009456	washer	180	1
13	001565	screw M12×45	180	1	40	001456	screw SW M10×30	180	2
14	002263	bearing 6008 2Z	180	2	41	001581	washer - flexible 10	180	2
15	004435	distance tubing	180	1	42	001537	spring 5×40×160×19,5	180	1
16	002332	pivot cover	180	1	43	002353	handling spring stop	180	1
17	001854	screw M12×25	180	1	44	002771	screw SW M8×40	180	1
18	001976	screw M8×30	180	1	45	001468	nut M8	180	1
19	001479	washer - flexible 8	180	1	46	002039	screw M12×20	180	1
20	006643	bow down backstop	180	1	47	009426	vice closing	180	1
21	001454	screw SW M8×25	180	1	48	006694	flexible plug 5×16	180	1
22	001468	nut M8	180	1					
23	001561	screw M6×20	180	2					
24	003802	angle scale	180	1					
25	001489	parker 3×10	180	2					
26	009451	backstop bar	180	1					
27	009450	backstop body with bar	180	1					

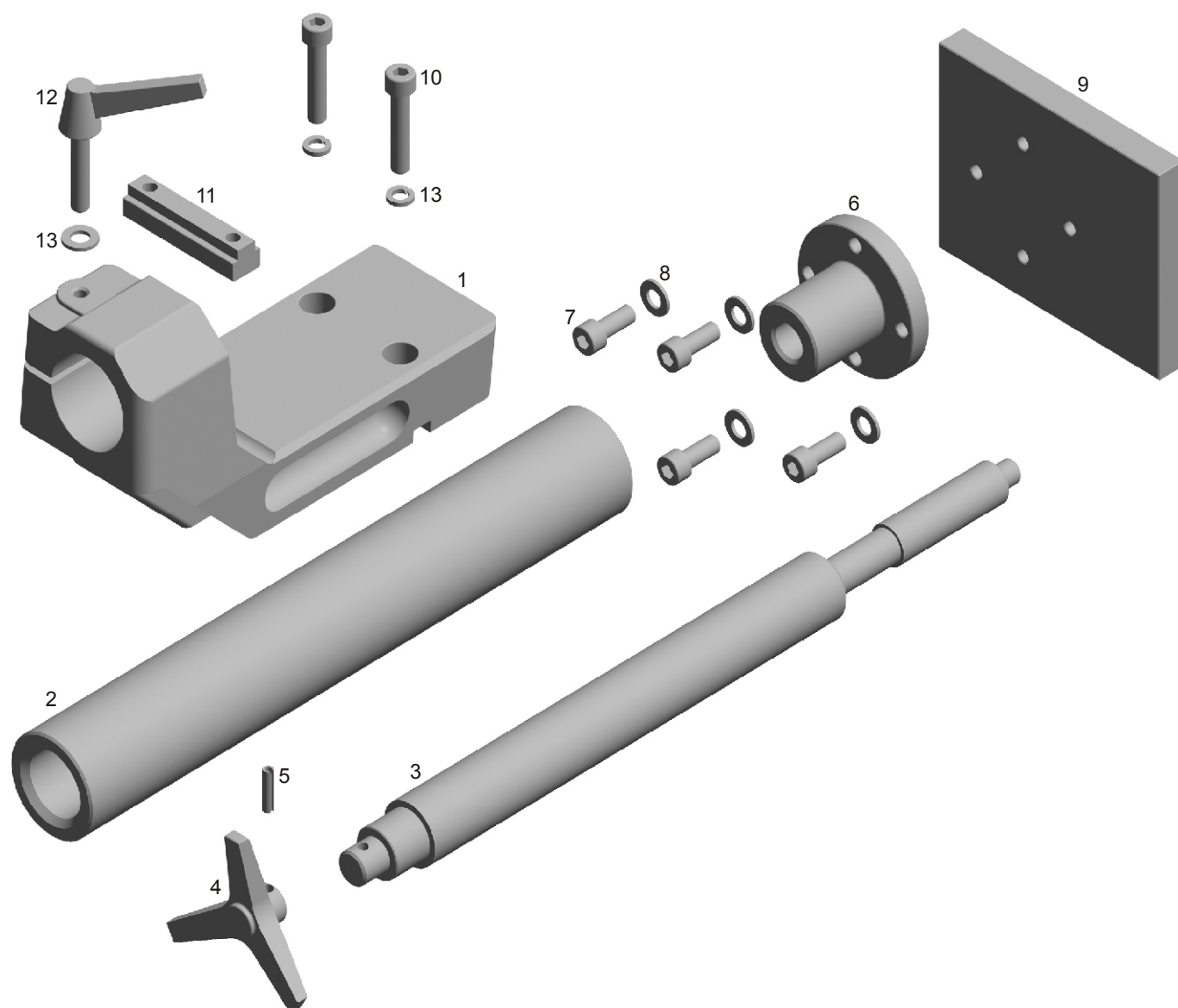
### 11.3.2. Turning table and pivot assembly ARG 200 Plus, ARG 220 Plus



ver. 2.7.2004

Pos.	Ordering number	Name	Type ARG	pcs	Pos.	Ordering number	Name	Type ARG	pcs
1	009447	table body	200,220	1	27	001447	screw M10×30	200,220	1
2	006527	turning table	200,220	1	28	001581	washer - flexible 10	200,220	1
3	006526	turning table plug	200,220	1	29	009451	backstop bar	200,220	1
4	009060	quick clamping lever	200,220	1	30	009450	backstop body with bar	200,220	1
5	009448	nut M20	200,220	1	31	001418	lever M8×15	200,220	1
6	002446	washer 20	200,220	1	32	002358	angle scale	200,220	1
7	005642	stud bolt M12× 80	200,220	4	33	001489	parker 3×10	200,220	2
8	001470	nut M12	200,220	4	34	001537	spring 5×40×160×19,5	220	2
9	001475	washer 12	200,220	4		001537	spring 5×40×160×19,5	200	1
10	005643	rubber washer	200,220	4	35	002210	handling spring stop	220	1
11	005053	right holder	200,220	1	36	002040	screw M8×16 NH	220	1
12	003539	left holder	200,220	1	37	001573	washer - flexible 6	220	1
13	001563	screw M10×40	200,220	6	38	001473	washer 6	220	1
14	007126	pivot	200,220	1	39	002553	limit switch backstop	200,220	1
15	001564	screw M12×30	200,220	2	40	001468	nut M8	200,220	1
16	001565	screw M12×45	200,220	1	41	002771	screw SW 8x40	200,220	1
17	001579	distance eccentric large	200,220	1					
18	002263	bearing 6008 2Z	200,220	2					
19	009449	distance tubing	200,220	1					
20	002039	screw M12×20	200,220	1					
21	002332	pivot cover	200,220	1					
22	002039	screw M12×20	200,220	1					
23	004312	spring console	200	1					
24	002034	screw M8×35	200	2					
25	001479	washer - flexible 8	200	2					
26	001474	washer 8	200	1					

### 11.3.3. Vice assembly ARG 200 Plus, ARG 220 Plus

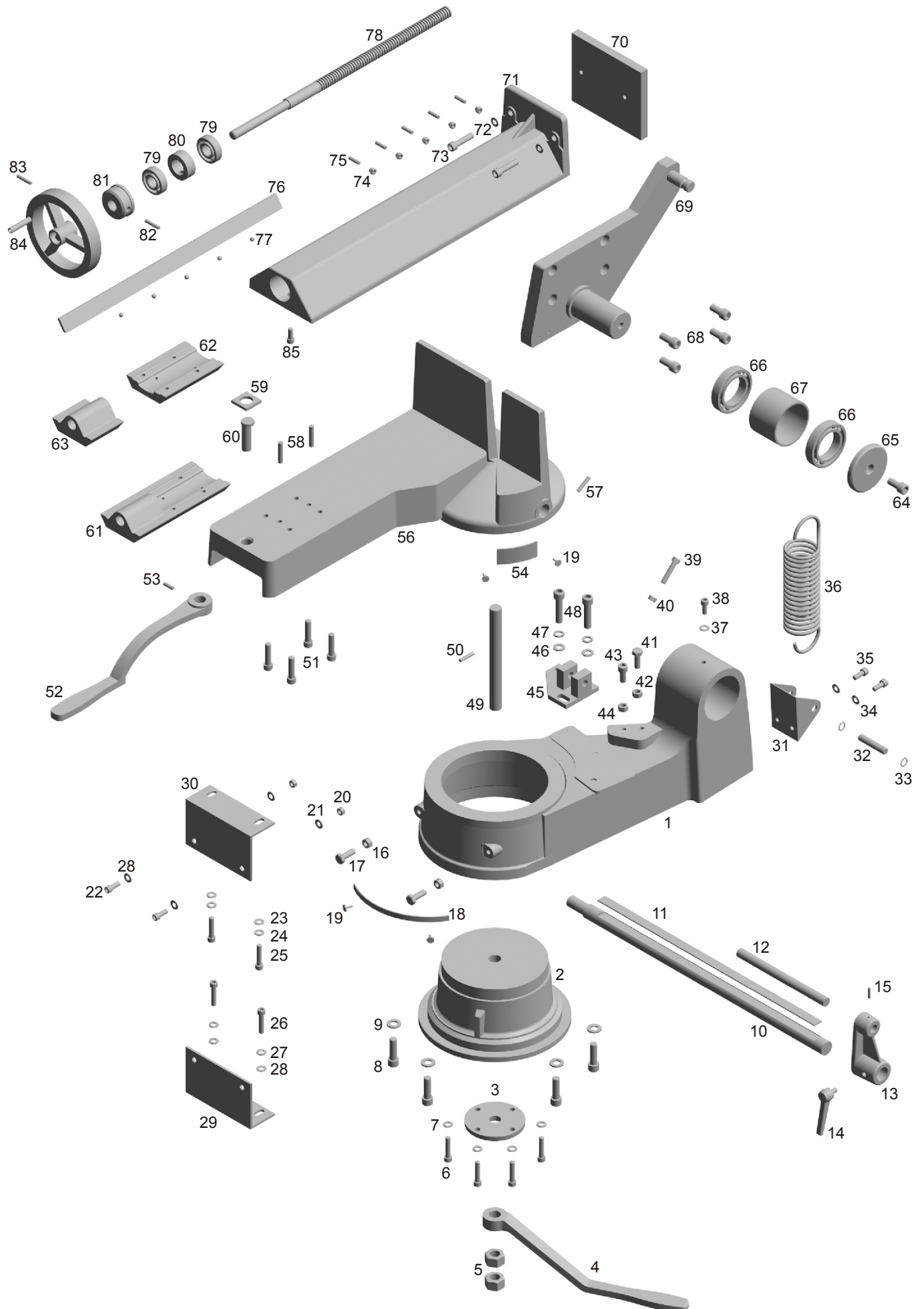


ver. 2.7.2004

Pos.	Ordering number	Name	Type ARG	pcs
1	009427	vice body	200	1
2	sestava 009416	slip nut	200	1
3	sestava 009416	vice screw	200	1
4	006862	plastic star handle	200	1
5	006872	flexible plug 6×12	200	1
6	009329	snub plate cover	200	1
7	001561	screw M6×20	200	4
8	001473	washer 6	200	4
9	009446	moving grip	200	1
10	001618	screw M8×40	200	2
11	009146	washer - rectangular	200	1
12	009055	lever - adjustable M8x45 metal	200	1
13	001474	washer 8	200	1

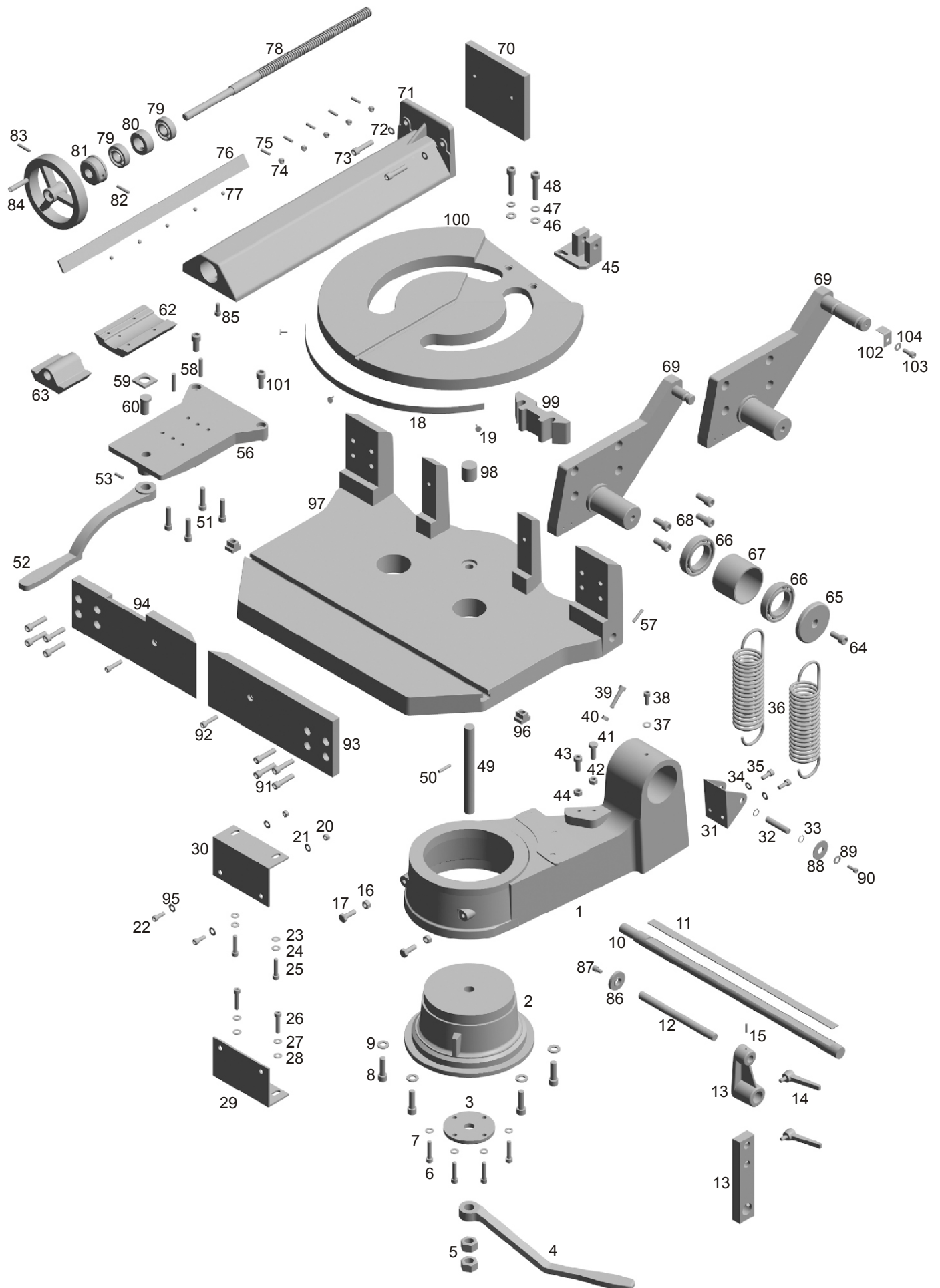


#### 11.3.4. Table, pivot and vice assembly ARG 230 Standard, ARG 230, ARG 240



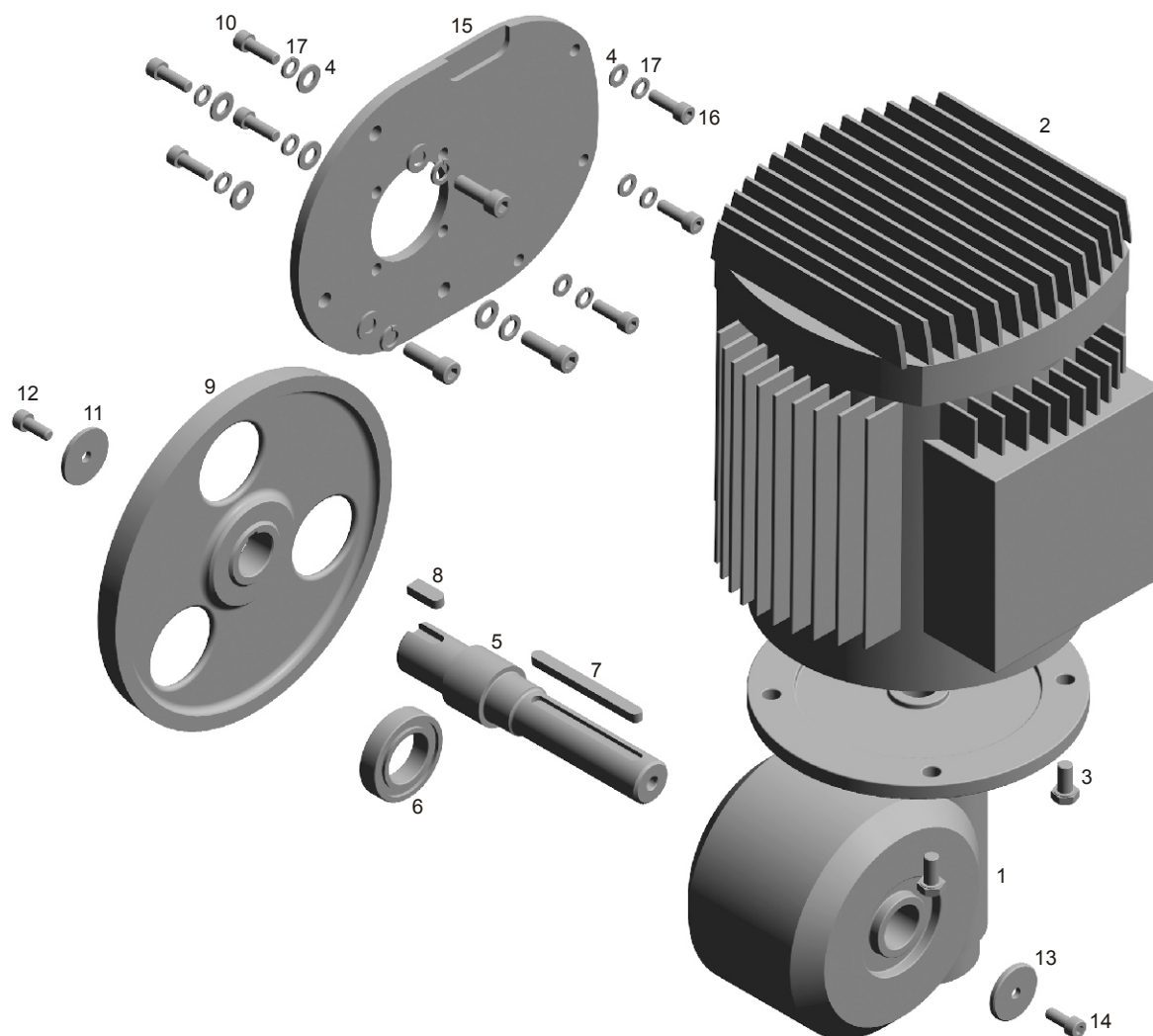


### 11.3.5. Table, turning table, pivot and vice assembly ARG 230 Plus, ARG 240 Plus, ARG 290 Plus



Pos	Ordering number	Name	Type ARG	pcs	Pos	Ordering number	Name	Type ARG	pcs
1	008599	turning table	230,240,290	1	57	001458	adjustable screw M8×10	230,240,290	1
2	001369	drum A	230	1	58	009586	cylindrical plug 8×20	230,240,290	2
	001501	drum C	230+,240,290	1	59	001366	fast clamping cube	230,240,290	1
3	001370	lever washer	230,240,290	1	60	001365	fast clamping eccentric	230,240,290	1
4	002189	table lever	230 Std.	1	61	008718	trapez. nut with guidance	230 Std.	1
	002158	table lever	230,240,290	1	62	001713	vice guidance + fast clamp.	230,240,290	1
5	001471	nut M20	230,240,290	2	63	008717	fast clamping trapez. nut	230,240,290	1
6	001443	screw M8×25	230,240,290	4	64	002112	measuring bolt Z.R.	230,240,290	1
7	001479	washer - flexible 8	230,240,290	4	65	001367	pivot cover	230,240,290	1
8	002280	screw M12×35	230,240,290	4	66	006474	bearing 6010 2Z	230,240	2
9	001582	washer - flexible 12	230,240,290	4		009605	bearing 32010 AX	290+	2
10	001363	backstop long bar	230,240,290	1	67	009587	distance tube	230,240	1
11	009295	backstop scale	230,240,290	1		009588	distance tube	290+	1
12	001364	backstop short bar	230,240	1	68	001450	screw M12×40	230,240,290	4
	001988	backstop short bar plus	230+,240+	1	69	009370	pivot	230	1
	002237	adjustable backstop bar	290	1		005013	pivot	240	1
13	001362	backstop body	230,240	1		009371	pivot	290	1
	002246	backstop guidance	290	1	70	001361	moving grip plate	230,240	1
14	001418	lever M8×15	230,240	1		002666	moving grip plate	290	1
	001418	lever M8×15	290	2	71	001954	moving grip	230	1
15	001457	screw - adjustable M6×12	230,240,290	1		002178	moving grip	240	1
16	001469	nut M10	230,240,290	2		002665	moving grip	290	1
17	001455	screw SW M10×60	230,240,290	2	72	001476	washer 10	230,240,290	2
18	001422	angle scale	230,240	1	73	001447	screw M10×30	230,240,290	2
	001498	angle scale	230+,240+	1	74	001712	secure nut M8	230	5
	002135	angle scale	290+	1		001712	secure nut M8	240	6
19	001489	parker 3×10	230,240,290	5		001712	secure nut M8	290	7
20	001468	nut M8	230,240,290	2	75	001617	adjustable screw M8×30	230	5
21	001479	washer - flexible 8	230,240,290	2		001617	adjustable screw M8×30	240	6
22	001441	screw M8×20	230,240,290	2		006429	adjustable screw M8×35	290	7
23	001476	washer 10	230,240,290	2	76	001495	ribbon	230	1
24	001581	washer - flexible 10	230,240,290	2		002187	ribbon	240	1
25	001445	screw M10×20	230,240,290	2		002669	ribbon	290	1
26	001441	screw M8×20	230,240,290	2	77	001711	ball 6	230	5
27	001479	washer - flexible 8	230,240,290	2		001711	ball 6	240	6
28	001474	washer 8	230,240,290	4		001711	ball 6	290	7
29	006451	vice down console	230,240,290	1	78	006958	trapez. bolt	230,240	1
30	006359	vice upper console	230,240,290	1		004769	trapez. bolt	290	1
31	001372	U100	230,240,290	1	79	001408	bearing 6204 2Z	230,240,290	2
32	001373	spring plug	230,240	1	80	008715	midst ring	230,240,290	1
	002168	spring plug	290	1	81	008716	support ring	230,240,290	1
33	001431	snap ring outer KR 20	230,240,290	2	82	009589	flexible plug 10×50	230,240,290	1
34	001479	washer - flexible 8	230,240,290	2	83	009597	flexible plug 8×40	230,240,290	1
35	001989	screw M8×25 NH	230,240,290	2	84	002111	vice handle with knot	230,240,290	1
36	001368	spring 7,1×64×221×17	230,290	1	85	001441	screw M8×20	230,240,290	1
	002165	spring 8×72×220×14	240,290	1	86	002248	backstop surface	290+	1
37	001476	washer 10	230,240,290	1	87	001939	screw M8×12	290+	1
38	001446	screw M10×25	230,240,290	1	88	001571	wide washer 6	290+	1
39	001623	screw SW M8×35	230,240,290	1	89	001573	flexible washer 6	290+	1
40	001468	nut M8	230,240,290	1	90	001442	screw M6×12	290+	1
41	001456	screw SW M10×30	230,240,290	1	91	002039	screw M12×20	230+,240+,290+	8
42	001469	nut M10	230,240,290	1	92	001441	screw M8×20	230+,240+,290+	2
43	001625	screw M10×35	230,240,290	1	93	006031	right grip plate	230+,240+	1
44	001469	nut M10	230,240,290	1		006729	right grip plate	290+	1
45	002275	down hydraulic holder	230,240	1	94	006030	left grip plate	230+,240+	1
	001503	down hydraulic holder	230+,240+,290+	1		006730	left grip plate	290+	2
46	001475	washer 12	230,240,290	2	96	001496	nut T 12	230+,240+,290+	2
47	001582	washer - flexible 12	230,240,290	2	97	009598	table plate	230+,240+	1
48	001564	screw M12×30	230,240	2		009599	table plate	290+	1
	001500	screw M12×90	230+,240+,290+	2	98	009603	plug	230+,240+	1
49	001360	table screw	230,240,290	1		009604	plug	290+	1
50	001666	cylind. plug 6×40+thread	230,240,290	1	99	007342	table cube	230+,240+,290+	1
51	001441	screw M8×20	230,240,290	4	100	009602	turning table	230+,240+	1
52	001357	fast clamping lever	230,240,290	1		009601	turning table	290+	1
53	009597	plug - flexible 8×40	230,240,290	1	101	001499	screw M12×30 NH	230+,240+,290+	2
54	001421	scale	230,240	1	102	002210	spring guard	290+	1
56	001355	vice body	230 Std.	1	103	001442	screw M6×12	290+	1
	002177	vice body	230, 240	1	104	001478	washer 6	290+	1
	002267	vice body plus	230+,240+	1					
	002668	vice body plus	290+	1					

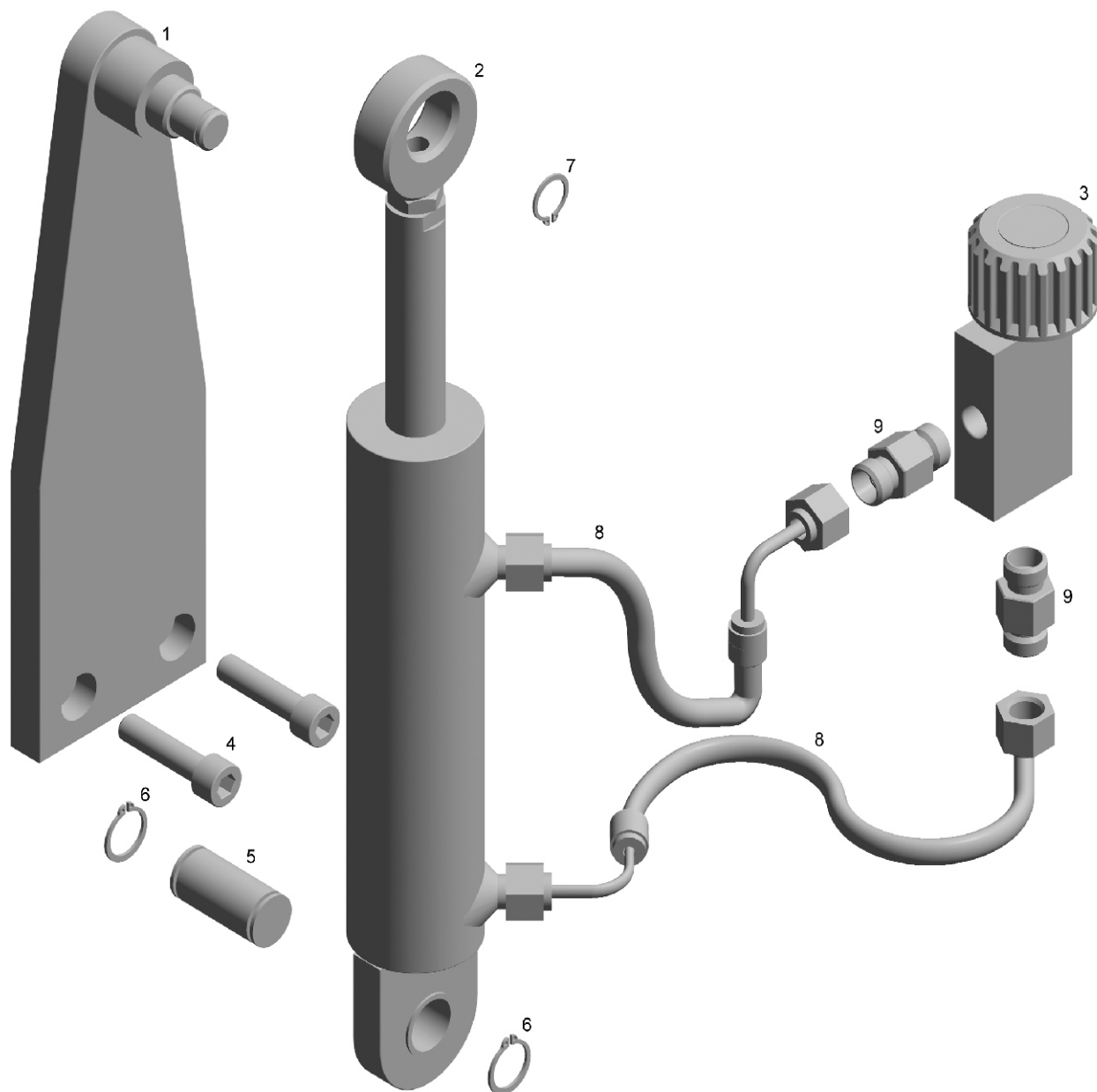
## 11.4. Drive assembly



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Pos.	Ordering number	Name	Type ARG	pcs	Pos.	Ordering number	Name	Type ARG	pcs
1	007404	gearbox SRS40, i=20, Ac19	180	1	8	002409	feather 8×7×20	180	1
	007401	gearbox SRS50, i=28, Ac24	200	1		001488	feather 10×8×25	200-240	1
	007402	gearbox SRS60, i=28, Ac25	220,230	1		005423	feather 12×8×30	290	1
	007399	gearbox SRS70, i=28, Ac30	240	1	9	002271	driving gear	180	1
	009354	gearbox SRS85, i=20, AC35	290	1		002970	driving gear	200	1
2	007405	elmot. 71, 4/2 pole B14 0,3/0,45 kW, 3 ph.	180	1		001342	driving gear	220,230,240	1
	007009	elmot. 80, 4/2 pole B14 0,75/0,95 kW, 3 ph.	200,230	1		002160	driving gear	290	1
	007761	elmot. 80, 4/2 pole B14 0,9/1,4 kW, 3 ph.	220,240	1	10	004237	screw M6×45	180	4
	006683	elmot. 100, 8/4 pole B14 0,9/1,7 kW, 3 ph.	290	1		001444	screw M8×45	200,220	4
3	004621	screw SW M6×20	180-240	4		001172	screw M8×60	240	4
	001454	screw SW M8×25	290	4		002029	screw M10×90	290	4
4	001474	washer 8	230	7		001443	screw M8×25	230	4
	001476	washer 10	230	3	11	001477	wide washer 14	180-290	1
5	007349	driving gear	180	1	12	001448	screw M12×20 NH	180-290	1
	006077	driving gear	200	1	13	002038	wide washer 8X27	180	1
	008019	driving gear	220	1		001477	wide washer 14	180-290	1
	006548	driving gear	230	1	14	002043	screw M6×40	180	1
	006598	driving gear	240	1		001563	screw M10×40	200	1
	002172	driving gear	290	1		001815	screw M12×60	220-290	1
6	008482	bearing 6006 2RS	180	1	15	006591	gearbox cover	230	1
	001406	bearing 6007 2RS	200,220	1	16	001443	screw M8×25	230	3
	001627	bearing 6207 2RS	230,240	1		001446	screw M10×25	230	3
	002186	bearing 6308 2Z	290	2	17	001479	washer flexible 8	230	7
7	004387	feather 6×6×45	180	1		001581	washer flexible 10	230	3
	004400	feather 8×7×60	200-240	1					
	001878	feather 10×8×110	290	1					

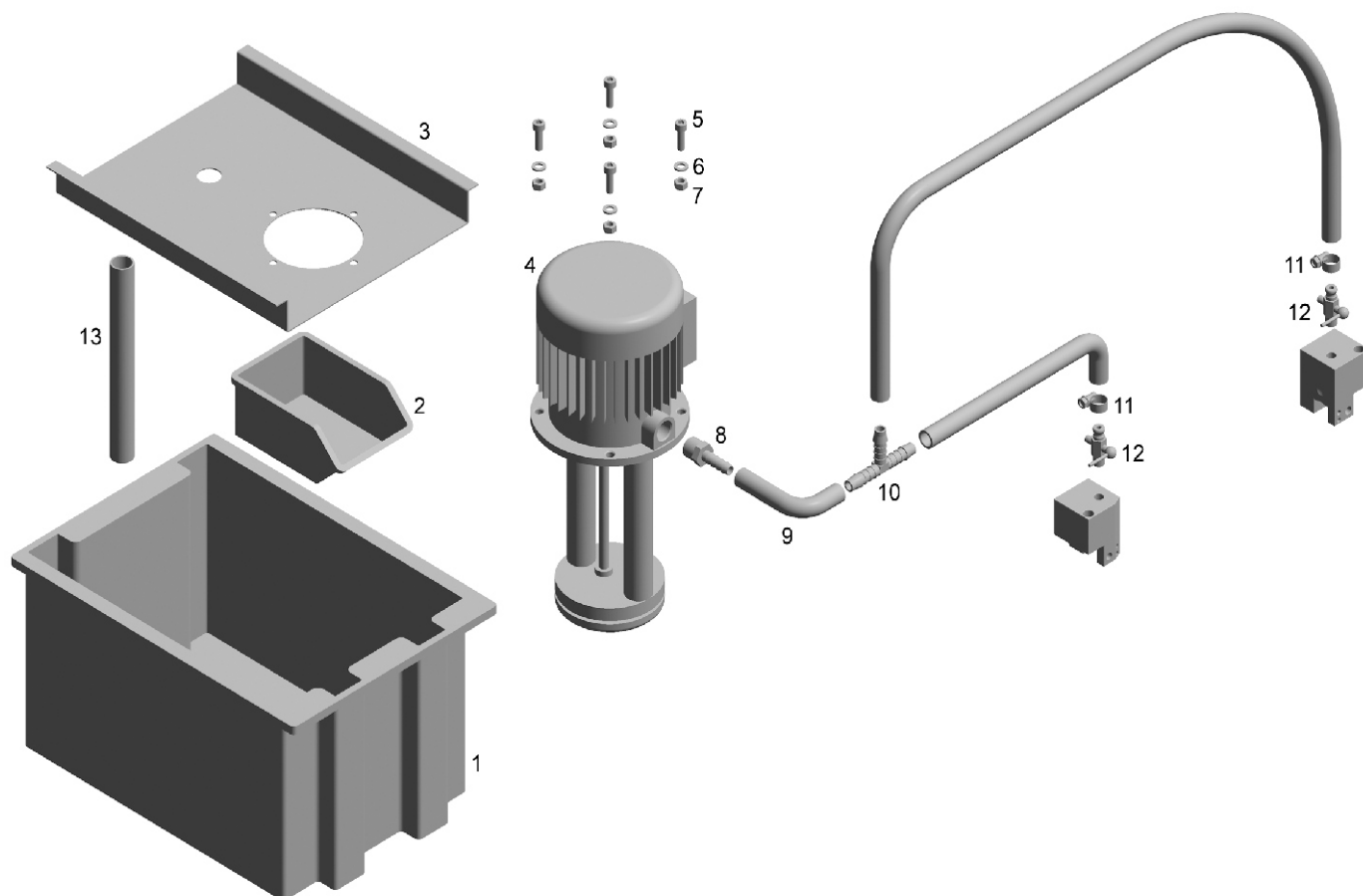
## 11.5. Oil damper assembly



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Pos.	Ordering number	Name	Type ARG	pcs
1	006600	holder of hydraulic cylinder	180	1
	006462	holder of hydraulic cylinder	200,220	1
	005887	holder of hydraulic cylinder	230,240	1
	006453	holder of hydraulic cylinder	230 Plus, 240 Plus	1
	006452	holder of hydraulic cylinder	290	1
2	006571	hydraulic cylinder PČH 40/18-133 low pressure	180,200,220	1
	006573	hydraulic cylinder PČH 60/18-152-V1 low pressure	230,240,290	1
3	006587	valve VS01-04/R3	180-290	1
4	001563	screw M10×40	180-240	2
	001447	screw M10×30	290	2
5	001386	plug of hydraulic	180-290	1
6	001429	snap ring outer KR 12	180-290	2
7	001430	snap ring outer KR 15	180-290	1
8	005748	hydr. hose NT DN 6x2200 DKL/90 08/10	180-220	2
	001696	hydr. hose NT DN 8x2500 DKL/90 M16x1,5	230-240	2
	007141	hydr. hose NT DN 8x3000 DKL/90	290	2
9	001986	right connection GES 8L/R	180-220	2
	002277	right connection GES 10L/R	230-290	2
	003569	hydraulic oil HM 46	180-290	0,75l

## 11.6. Coolant assembly



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Pos.	Ordering number	Name	Type ARG	pcs
1	001397	Coolant fluid tank	180-290	1
2	001335	setting pot ERBA	180-290	1
3	001387	cover of coolant fluid tank	180-290	1
4	006468	pump SACEMI PA 35, 3 fáze, 230/400 V	180-290	1
5	001440	screw M6×16	180-290	4
6	001573	washer 6	180-290	4
7	001467	nut M6	180-290	4
8	006860	connection 3/8" - 9 mm	180-290	1
9	001399	hose PVC DN 8×2	180,200	3,6 m
	001399	hose PVC DN 8×2	230	4 m
	001399	hose PVC DN 8×2	240,290	5 m
10	001401	T connection TS 10	180-290	1
11	001389	hose clip 7-13	180-290	2
12	001402	tap 050	180-290	2
13	001400	trash hose 19×3	180-290	0,7 m

## NOTES:

